

Applicant Name Bainville, Town of
Project Title Wastewater System Improvements

Project Abstract

Bainville's collection system constructed in the 1950s consisted of 8-inch clay tile. Twenty percent of the pipe and the lift station were replaced in 1999. The lagoons were constructed circa 1975, without lining. In 2008 the town constructed a new lagoon system, which was unable to meet the incredible growth rate and the primary cells stayed septic well into summer. The stench from overloading is a nuisance. A moratorium on construction was placed in 2010.

The town has worked with MacBain Properties to provide more storage to the lagoon system, and converted its existing storage cell to another primary cell. Soon the MacBain project will be undersized.

Based on field surveys by the Council, the lagoons serve over 400 persons and about 300 at the mancamp. The town is constantly approached by people wanting to build in town.

The town has collected impact fees of \$7,300 for wastewater. This fee has caused a drop in interest, particularly from hotels. Assistance will mean that fees can be more reasonable and an aerated system that can also take in septage can be constructed.

The Preliminary Engineering Report (PER) proposes the following actions:

- Upsize the lift station from 55 gpm to 150 gpm; and
- Provide aerated lagoon treatment and take advantage of the storage pond and irrigation system being installed by MacBain Properties (see the Memorandum of Understanding in the PER appendix).

The lack of treatment facilities combined with the extreme need for labor is an equation for environmental disregard, and compromising of community health and safety. It is imperative that Bainville be allowed to grow in order to provide the intensely needed housing, and to provide community services to accommodate people with a safe environment, and avoid dumping elsewhere.

Applicant Name Bainville, Town of
Project Title Water System Improvements

Project Abstract

The town had a population of just over 150 in 2008. It will soon reach 858. As of March 2013 applications were submitted for about 50 more permits including apartments and multiplex housing, not included in that 858. The design population has been established at 1,500, which should happen fairly quickly now that the construction moratorium has been taken off since the end of 2013 (though growth is slower due to weather and impact fees for wastewater). The storage tank is very old (pre-1940s) and very undersized for the expanding population and pressures are low, at just about 30 psi in the area of the school. Pipe sizes are very small (4 to 8 inches, but mostly 4 and 6). With under 100,000 gallons of storage, the town is at roughly 1/5th of the storage recommended by the state, in accordance with Montana Department of Environmental Quality (DEQ) publication Circular 1.

The city cannot meet state design criteria for the distribution system. At the higher elevations of water service, most notably the Bainville School, 35 psi cannot be obtained. Hydrants throughout town average fire flows at approximately 500 gpm.

However, as part of Dry Prairie, there have been no water quality violations.

The proposed project would:

- Replace the existing water storage tank with a 350,000-gallon buried-concrete tank; and
- Replace approximately 4,000 feet of corroded cast iron pipeline.

The project promotes energy efficiency for the Dry Prairie Rural Water System.

Applicant Name Beaverhead County
Project Title Beaverhead County Big Hole Stewardship Cooperative

Project Abstract

The biggest challenge facing the West in the 21st century will be maintaining enough cold, clean water to support our communities, economies, fish, wildlife, and agriculture. Because our precipitation patterns are less predictable and our spring runoff less gradual and extended, efforts that keep water in our basins for multiple uses are of growing importance.

The best way to ensure adequate water supply is to keep surface and groundwater in the originating basin as long as possible. The largest reservoir each watershed has is its floodplain and shallow groundwater aquifers.

The floodplains of Montana are largely in private ownership. Therefore, a program that promotes maintaining and improving floodplain functions through private management is a priority for future water management.

This pilot project creates a program that incentivizes private landowners to produce ecosystem services through their stewardship. The pilot project builds on successful models throughout the country and is located in a watershed known for innovative management. The ecosystem services focuses on maximizing floodplain functions to absorb water and recharge aquifers. Targeting floodplain and riparian systems for ecosystem services attenuates flood flows, improves water quality, provides fish and wildlife habitat, and protects human health and safety.

The pilot project will establish the structure and instruments necessary to implement payment for ecosystem services program. The Big Hole Stewardship Cooperative will follow its strategic plan (2012) and adopt the accounting and crediting system developed by Willamette Partnership along with Cooperative bylaws, legal agreements, monitoring protocols, and financial oversight systems. This scalable program will use funding secured through a federal grant to provide payments to enrolled land stewards. The pilot project will demonstrate the value of this new, market-driven approach to conservation and be positioned to attract sustaining buyers and long-term funding streams to maintain and expand the program.

Applicant Name Big Sandy, Town of
Project Title Water System Improvements

Project Abstract

Water is supplied to the town of Big Sandy's public water system from three groundwater wells just east of town. This supply is capable of providing 237,600 gallons per day (gpd). The town has permanent mandatory watering restrictions in place and has historically been able to keep up with demands.

A Preliminary Engineering Report (PER) identified the following problems in the system:

- The distribution system is in need of immediate attention. The 4-inch cast or ductile iron and asbestos concrete pipes are in poor condition. These mains also need to be upsized to meet Department of Environmental Quality (DEQ) standards. Also, the poor condition of these mains creates a serious concern during fire events should the fire department need to pump from the hydrants fed by the mains;
- The town also has six dead-end mains that should be looped, as these mains tend to allow water to become stagnant; and
- The water fill station by the park does not have a backflow prevention device installed.

The town is proposing the following work to address the deficiencies:

- Construction of approximately 10,837 linear feet of water mains and the corresponding connections, valves, boxes, and fittings;
- Replacement of seven fire hydrants; and
- Bulk facility/fill station improvements.

Applicant Name	Bitter Root Irrigation District
Project Title	Siphon 1 Improvements, Phase 3

Project Abstract

The Bitter Root Irrigation District (BRID) in Ravalli County provides irrigation water to approximately 1,400 irrigators on 16,665 acres along a canal system over 70 miles long. This project involves improvements of Siphon 1-Phase 3, a 877-foot section of the 5,654 foot-long steel pipeline and supporting bridge crossing the Bitterroot River constructed in 1909. This siphon and bridge deliver surface water from the source at Lake Como to the delivery ditches and canals throughout the eastern side of the Bitterroot Valley.

The siphon and bridge both present serious problems with structural integrity, leaking, and potential failure. Deterioration of the pipe, expansion joints, shallow pier footings, and bridge trusses are evident. Investigation indicates that the existing bridge footings lack sufficient depth and migration of the river would result in collapse of the entire bridge. Failure of any major element could result in a total loss of irrigation water to the Bitterroot Valley served by BRID and damage to the river system, wetlands, residential homes, and the adjacent U.S. highway. Severe economic implications to agriculture, the economy, and recreation would occur with failure of this infrastructure.

When a major leak occurs, it is necessary to drain the siphon so that repairs can be made and several days in the irrigation season can be lost. This has happened several times in recent years. The importance of the Bitter Root Irrigation District to the local agricultural economy is tremendous. In 2013 alone, the crop market price for the irrigators on the system was \$9 million.

This project encompasses numerous renewable resource and public safety benefits. The proposed project provides a free-span across the active channel; the existing bridge piers in the channel are hazardous to river users. This request is to fund Phase 3 construction of this high-priority, shovel-ready project.

Applicant Name	Bitterroot Conservation District
Project Title	Supply Diversion Improvements

Project Abstract

The Supply Diversion is a low-head diversion dam in a high-use area of the Bitterroot River. Under the existing condition, a concrete wall diverts surface water for agricultural irrigation. The low-head diversion is extremely dangerous because of the hydraulic conditions it creates. During many flow conditions, the diversion dam creates a hydraulic roller or "keeper hole" that traps river users and boaters. Once in the hydraulic roller, it is nearly impossible to escape. Many rescue attempts and a drowning of a little girl occurred in the recent past.

Recent shifts in the geomorphology of the river have further directed flows and river users toward this dangerous structure. As a result of the large number of incidents, the State of Montana temporarily officially closed this five-mile section of river to public use during high water. The proposed project seeks to improve the existing diversion to allow for safer interactions with the public and reduce the need for river closure. The current dam configuration functions to deliver irrigation water; however, drowning and temporary closure of the river do not promote sustainability.

The preferred alternative incorporates modifications including a boat chute to promote safety and ease of passage over dam. In addition to the significant safety components of the proposed project, numerous resource benefits exist. This project provides surface water conservation through promotion of sustainable use of the surface water resource. A log grate is incorporated to allow the irrigators to manage the irrigation water into the system. In the past, logs and debris plugged the intake, making management of irrigation water delivery difficult. The diversion modifications will function to enhance fish passage. The project provides passage to a greater number of aquatic species and ages over a wider range of flows. This improvement will preserve aquatic habitat.

Applicant Name
Project Title

Black Eagle Sewer District
Collection System Rehabilitation, Phase 2

Project Abstract

The purpose of the Black Eagle Sewer Rehabilitation project is to provide improvements to nearly 5,405 feet of existing sewer collection main and 24 manholes. The project is located sporadically throughout the community of Black Eagle. The existing system is between 54 and 88 years old and is experiencing deterioration and possible failure in various locations. Key issues include potential exfiltration of untreated wastewater to nearby aquifers, infiltration of groundwater into the pipe system, and pending structural failure resulting in possible contamination of the groundwater and, in select locations, likely contamination of the Missouri River. The project intends to utilize cured-in-place pipe (CIPP) lining to rehabilitate structurally sound components to the maximum extent feasible. The components deemed structurally unstable will be replaced with new elements. The implementation of the proposed project will provide a safe and reliable wastewater collection system, conserve the areas existing area's aquifers, and maintain water quality of the Missouri River. Additionally the project will prevent groundwater infiltration which will save money for the community, which pays the city of Great Falls for treatment on a volume basis. It will also save energy and resources used to treat the clean infiltration water. The project will provide a sewer system able to accommodate anticipated population growth and serve the community into the future.

Applicant Name	Bozeman, City of
Project Title	Sourdough Canyon Natural Water Storage Assessment and Pilot Project

Project Abstract

Bozeman is experiencing tremendous growth and meeting future water needs requires 17,750 acre-feet of additional reliable water supply to serve the projected 50-year water demand. The Bozeman City Commission recently adopted an Integrated Water Resources Plan (IWRP) which defined the projected 50-year water needs, and identified and evaluated several supply alternatives to meet the anticipated water balance gap. One of the primary alternatives identified in the two-year planning process is development of new water storage in Sourdough Canyon, one of Bozeman's three municipal watersheds. Recent planning activities of the Upper Missouri Basin Advisory Council, as part of the updated state Water Plan process, have also recognized the need to integrate natural water storage development as an important component of the Upper Missouri Basin watershed plan. Innovative approaches to new water storage developments are needed to increase water availability, limit environmental impacts, and protect existing water rights. Projects that enhance the natural storage capacity of the riverine environment increase the management options and can augment water availability during critical low-flow periods. Increased storage capacity within natural systems can have additional benefits to improve water quality, ecologic function, and economy. This project seeks to fully assess, quantify and demonstrate the ecological and water management benefits, while potentially providing additional municipal water storage capacities. The Sourdough Canyon Natural Water Storage Assessment and Pilot Project would be the first project of its kind in Montana, serving to assess the feasibility of enhancing the natural capacity of the environment to store water for beneficial uses. The project proposes a technical feasibility study, environmental assessment, and engineered design and construction of a pilot project to assess and quantify benefits and impacts to environmental health, ecologic function, local economics, and closed-basin water rights.

Applicant Name Buffalo Rapids Irrigation Project District 1
Project Title Lateral 19.3 Pipeline Conversion, Phase 1

Project Abstract

Buffalo Rapids Irrigation Project (BRIP) District 1 is applying for grant funding from the Montana Department of Natural Resources and Conservation (DNRC) Renewable Resource Grant and Loan (RRGL) Program for design and construction of a Lateral-To-Pipeline Conversion Project on Lateral 19.3. The proposed project would conserve water, improve water resource management, preserve water quality, and reduce energy consumption.

BRIP District 1, working in coordination with the local Natural Resources Conservation Service (NRCS), completed an overall system assessment of the irrigation infrastructure within the district. The NRCS measured water delivery efficiency and seepage losses along with ranking the laterals for repair/rehabilitation. Over the last 15 years BRIP District 1 has worked with the NRCS, DNRC, and the U.S. Bureau of Reclamation (USBR) to replace over 80% of the open lateral delivery systems with closed pipeline networks to conserve water and improve management. The next priority for the BRIP District 1 is the conversion of Lateral 19.3 which irrigates 1,600 acres. Inspection of the existing system found the lateral in worse shape than described in the 1990s NRCS report. Vegetative overgrowth, seepage loss, conveyance losses and poor water management cause the system to lose up to 4.13 cubic feet per second (cfs) (373 million gallons) annually. Installation of the proposed improvements will eliminate seepage and conveyance losses; improve water resource management; preserve water quality in the Yellowstone River; and conserve energy at the Glendive Pump Station.

The Lateral 19.3 Project will improve water conservation and management as well as preserve water quality in the Yellowstone River. The project has the potential to increase revenue generation within the district by approximately \$252,400 annually. Implementation of the proposed improvements will result in conservation of water, improved water management, increased crop production, and a benefit to the local and state economies.

Applicant Name Buffalo Rapids Irrigation Project District 2
Project Title Main Canal Rehabilitation

Project Abstract

The Buffalo Rapids Irrigation Project (BRIP) District 2 is applying for grant funding through the Renewable Resource Grant and Loan (RRGL) Program for the design and construction of the Main Canal Rehabilitation Project within the Shirley Unit. The proposed rehabilitation project will conserve water, improve water resource management, improve and preserve soil quality, and improve agricultural production within the BRIP District 2.

The Shirley Unit is one of three irrigation units within the BRIP District 2 system, approximately 13 miles southwest of Terry. This application targets the "Jenny Reach" of the Shirley Main Canal near the halfway point of the delivery system. The Jenny Reach has historically experienced severe seepage and conveyance losses resulting in damage to adjacent acres and poor irrigation delivery efficiency to 2,000 acres downstream of the reach. BRIP District 2 is applying for grant funding assistance to install seepage abatement measures through the 0.75-mile Jenny Reach along with replacement of the existing headgate structures. The proposed project will conserve up to 16 cubic feet per second (cfs) (4,440 acre-feet) of water annually. Additionally, it will restore production to nine acres damaged and unproductive from seepage-driven oversaturation and saline seep contamination preserving 240 adjacent acres.

The Main Canal Rehabilitation Project will help the BRIP District 2 to conserve water, improve water resource management, preserve soil quality, and develop acres damaged over the years. Implementation of the project is projected to generate an additional \$166,700 annually in increased production. That equates to a \$1,912,049 increase in revenue generation from the project over the 20-year design life. This increase in production and revenue generation will benefit the local and state economies. Implementation of the Main Canal Rehabilitation Project will help ensure the sustainability of the BRIP District 2 and agricultural production within the lower Yellowstone Basin.

Applicant Name	Butte-Silver Bow
Project Title	Moulton Reservoir Reclamation and Protection Project

Project Abstract

Butte-Silver Bow (BSB) is committed to protecting its potable water sources and improving recreational opportunities through the Moulton Reservoir Reclamation and Protection Project. The project site is approximately 6 miles north of Butte on Butte-Silver Bow-owned property. The project will minimize sediment loading sources to the Moulton Reservoir, one of Butte's vital sources of public drinking water. The project will also provide improved, safe public access to the surrounding area, a direct public benefit through the rehabilitation, conservation, and management of this integral renewable resource.

BSB acquired the property in 1992 as part of the acquisition of the Butte Water Company. The Moulton Reservoir is part of a complex, network built by the former Anaconda Minerals Company to replace groundwater sources contaminated by mining activity. Over time, the upland slopes and roads northwest of the Reservoir have begun to erode, and there are signs of increased sediment loading into the water.

The project goals include stabilization of the eroding upland slope and removal of the dirt boat access ramp on the northwestern corner of the reservoir to minimize sediment loading and direct connection to the reservoir. Since there is no vegetated buffer in this area, establishment of this buffer to minimize erosion is proposed. Secondly, this project will assess the viability of the existing liner on the eastern dam face, replace the geotextile cover, and install larger diameter angular rock to minimize sun damage and deterioration of the cover. In addition to erosion control, another important aspect of the project is to enhance the site for recreational use. Before road upgrades, the Moulton area access was limited by difficult terrain and poor access. More recently, the public has started to use the area to recreate, and the proposed, 18-month project is needed to improve safety and access. Lastly, BSB will pursue opportunities to secure resources to improve access to the park and install recreation amenities such as trails, signage, culvert crossings, walking access, and fencing. This includes upgrades to the existing maintenance access and parking facilities.

Applicant Name

Cascade Conservation District

Project Title

Transition Agriculturalist: The Missing Link

Project Abstract

Montana's primary agricultural industries are cattle and wheat. The prices and profit margins vary and depend on a number of factors outside of the farmer's control such as precipitation and drought. Research institutions, agencies, and NGOs produce a great deal of information on how to adapt to these changing conditions. But farmers cannot always find and compare information from these different places and balance it with economic concerns.

Producers need an unbiased clearinghouse for information—one place that houses all of the information needed to consider and possibly make changes to their operations. This Transition Agriculturalist (TA) pilot project will develop a Web-based Information clearinghouse, managed by a knowledgeable, unbiased person to help the information. The TA will prepare comprehensive, digestible information for landowners explaining how they can capitalize changing markets and account for changing precipitation and drought patterns. This project is important to a broad range of interests in Montana, all of which will be invited to participate. It will be funded through a combination of local, state, federal, foundation, and industry contributions. Through the innovative creation of a clearinghouse and a central point of contact, Montana will maintain its role as a natural resource leader, continuing to supply food to the nation and world.

Applicant Name Cascade, Town of
Project Title Missouri River Reclamation

Project Abstract

Cascade is requesting \$124,628 from the Montana Department of Natural Resources and Conservation (DNRC) Renewable Resource Grant and Loan (RRGL) Program funds to complete a project intended to protect, preserve, and restore renewable resources related to unused municipal infrastructure. The project encompasses three elements that the town considers detrimental to high-quality resources. (1) The left bank of the Missouri River at a town park, situated on a closed landfill, needs protection against erosion to contain the old waste. (2) An island in the river east of town is the site of the former wastewater treatment facility, where the old infrastructure is still in place. The former wastewater lagoons create a barrier to wetland connectivity and currently host mostly non-native vegetation communities. (3) The last element of the project involves an abandoned water line secured to the bottom of the decking on the Central Avenue bridge across the Missouri River. The pipeline is deteriorating and presents potential hazards in the form of physical collapse and/or as a conduit for contaminants or pathogens into groundwater and soil near the Missouri River.

The project intends to develop the appropriate protection of the river bank at the park to keep the old waste contained. The degraded, unused wastewater infrastructure on the island east of Cascade will be removed, the berms will be strategically breached and the area replanted to provide additional diversity. The abandoned water line will be removed.

ToApplicant Name Chester, Town of
Project Title Wastewater System Improvements

Project Abstract

Chester's wastewater system is a clay-lined, three-cell discharging facultative lagoon system, constructed in 1984. The collection system pumps from the Main Lift Station to the lagoons, to the multi-level outlet and then discharged into Cottonwood Creek under the town's Montana Pollutant Discharge Elimination System (MPDES) Permit. Operators use a controlled discharge, holding discharge until presampling of the last cell indicates that it will meet effluent limits. Chester's collection system, constructed in the 1940s and 1950s consists of vitrified clay, unreinforced concrete, and cast iron pipe. Since 1998, approximately 2,100 feet of sewer main and three manholes have been replaced. New pumps at the lagoon lift station were installed in 1984 as part of the treatment system upgrade. The lagoon has no significant problems. Odor during spring turnover is an issue.

The Preliminary Engineering Report (PER) identified multiple issues within the collection system and components, including:

- System piping is past its useful life, is cracking and/or collapsing, has infiltration, mineral deposits, root intrusions, and a high propensity for failure;
- The main under Cottonwood Creek has a shallow depth and is exposed during runoff, creating a high probability for failure and discharge of raw sewage;
- The main running directly under the hospital is in poor condition, with high failure probability. Repairs would be extremely difficult and failure would result in untreated sewage backup into the hospital;
- Perforated manhole covers allow infiltration;
- Lift station controls are outdated and lack appropriate alarm systems; and
- Multiple collection mains do not meet the Montana Department of Environmental Quality (DEQ) requirements.

The town will implement the following:

- Solar mixer in lagoons to negate spring odor issues;
- Rerouting the main under the hospital; and
- Rehabilitation or replacement of lines with infiltrations, cracks, collapses, and other issues, and the main under Cottonwood Creek.

Applicant Name	Clinton Irrigation District
Project Title	Main Canal Wasteway Rehabilitation

Project Abstract

The Clinton Irrigation District (CID) is applying for funds from the Renewable Resource Grant and Loan (RRGL) Program for design and construction of the Main Canal Wasteway Rehabilitation and Intake Canal Improvements Project. The proposed project will address Issues of water conservation, irrigation and operational efficiency, and the preservation of residential areas.

In November 2007, the district obtained Montana Department of Natural Resources and Conservation (DNRC) planning grant funds to conduct an inventory and rehabilitation assessment of the district's irrigation infrastructure and develop a Rehabilitation Priorities List. The district has completed the top three priorities on this list. These projects were made possible through the funding by the RRGL Program. The next step in improving the CID's infrastructure to a functional system is to rehabilitate the wasteway structure.

A field investigation of the wasteway structure revealed that it has operated well beyond its design service life. The structure was constructed in the early 1980s and uses an outdated check-board system to control water, which is inherently inefficient and dangerous to operate. Furthermore, the structure has degraded to a state of ineffectiveness. Consequences of the defective structure include: (1) operation of the structure requires the operator to get into the moving water; (2) 350 million gallons of the district's water diverted for irrigation is lost each year due to severe erosion underneath the structure, resulting in lower crop production; and (3) during high flows the wasteway structure is difficult to adjust and is capable of discharging only 61 million gallons (94 cubic feet per second (cfs) of the possible 133 million gallons (206 cfs) introduced to the system each day, resulting in an increased risk of residential flooding. (4) During operational flow the intake canal loses 222 million gallons of water each year due to infiltration. Each of these issues will be mitigated with installation of a new wasteway structure and the installation of canal liner within a portion of the intake canal.

Applicant Name Conrad, City of
Project Title Water System Improvements

Project Abstract

The Conrad Water System Improvement Project has three parts: First, improvements to the treatment plant will correct an air binding problem which causes excess backwash cycles. The plant operation was studied to analyze the problems. The treatment plant has experienced above average backwash frequency during the winter months. The excess backwashing reduces treatment efficiency. Testing under way has showed that 4.6% of treated water produced is wasted during backwash. The process is wasteful of the energy consumed during the excess backwash cycles and of resources used to produce treated water that is subsequently wasted during the cycle. To improve efficiency and provide treated water to Conrad and Brady residents, improvements must be made. It is expected that the current testing will result in a chemical adjustment at the water treatment plant to address the air binding at the filters.

A second part of the project up-sizes old and deteriorating 4-inch lines. The majority of the water mains were originally installed in the 1960s and 70s with some of the oldest water mains dating to the 1950s. While some upsizing and elimination dead-end lines, has been done, undersized 4-inch mains and hydrants still need to be upsized to bring the existing system into compliance with the Montana Department of Environmental Quality (DEQ) 6-inch minimum standard and to assure sufficient fire flows and water flow. The risks to resources and citizens include undetected leakage in the old and deteriorating lines and the risk of line collapse during a fire due to increased velocities of pumped water.

A third part of the project addresses the preventive maintenance of the storage facility to extend tank life and avoid expensive repairs or tank loss.

Applicant Name

Crow Tribe of Indians

Project Title

Renewable Energy Technology Wastewater Treatment Facility

Project Abstract

The Crow Tribe is proposing to replace approximately 6,720 linear feet of wastewater main and replace and relocate the existing East Frontage Road lift station in Crow Agency. The main is about 46 years old, made of vitrified clay pipe (VCP), undersized, laid at less than minimum slope standards, and afflicted with sags, adverse grades, offset joints, root penetrations, service line protrusions, cracks, broken pipes, and holes. Due to these conditions, the system is plagued with frequent plugging and incidents of surfacing sewage. The East Frontage Road lift station is 20 years old. It is a critical piece of infrastructure as it serves the U.S. Indian Health Service Crow and Northern Cheyenne Hospital and Awe Kualawaache Care Nursing Home as well as U.S. Bureau of Indian Affairs Police Station, Songbird Daycare, four businesses at the intersection of Highway 212 and Interstate 90, Apsaalooke Nights Casino and Cafe, and approximately 18 residences. The lift station has several deficiencies. Operators must manually clean the bar screens, the electrical equipment is faulty and does not meet current design standards, and it is situated in a flood-prone area. In spring 2011, Crow Agency experienced significant flooding from the Little Bighorn River. Flood waters overtopped the railroad, Interstate 90, and the East Frontage Road to inundate the lift station, rendering it not only inoperable but also inaccessible to make repairs. Because the lift station was not functional, all facilities south of the Little Bighorn River were without sewer service for 10 days. The project will preserve soil, water quality, fish and aquatic habitat, and wildlife habitat and administer engineering studies that identify alternatives for renewable resource projects.

Applicant Name	Crow Tribe of Indians
Project Title	Wastewater Collection System Improvements

Project Abstract

In March 2011, the Crow Tribe completed construction of a four-cell aerated lagoon in Crow Agency. The Tribe purchases electricity to power the blower room from Big Horn County Electric Cooperative, Inc. In 2012, the blower room consumed 358,720 kilowatt-hours (kWh) of electricity at a cost of \$28,350. In 2013, the blower room consumed 332,160 kWh of electricity at a cost of \$27,500. The Tribe proposes to install photovoltaic (PV) or solar equipment at the lagoon to generate renewable energy, decrease its reliance on traditional energy sources, reduce its electrical costs, and protect itself against rising energy costs. The proposed project will conserve approximately 15,600 kWh of energy per year and \$1,272 per year in today's dollars. Over the life of the PV system, 30 years, the Tribe will have conserved approximately 468,000 kWh and saved approximately \$38,160 in today's dollars. The proposed project will conserve energy, develop a renewable energy project, and administer an engineering study that identified alternatives for a renewable resource project. Additionally, the project will benefit the health and welfare of Montanans by reducing air pollution generated by power plants and providing savings that can be allocated to other community improvement projects.

Applicant Name Cut Bank, City of
Project Title Wastewater System Improvements

Project Abstract

Cut Bank's wastewater lagoons discharge to Old Maids Coulee under a Montana Pollution Discharge Elimination System (MPDES) permit issued by the Montana Department of Environmental Quality (DEQ). The permit sets the effluent limits that the City must meet. It also dictates monitoring and reporting requirements.

The current permit was reissued March 1, 2012. DEQ completed an analysis of the discharge and determined the conditions (discharge limits, monitoring requirements, etc.) of the new permit. The analysis is included in the "Statement of Basis". The Statement of Basis also includes requirements and compliance schedules for new permit limits. The new Cut Bank permit includes an ammonia limit of 1.0 mg/1 at the discharge pipe and a compliance schedule for the city to meet the limit. The city was required to complete a Preliminary Engineering Report (PER) to develop a plan for meeting the ammonia limit by March 1, 2014. The 2012 PER and 2014 PER update have been completed to meet this requirement. The city must meet the MPDES permit discharge limits, including ammonia, by March 1, 2016.

To meet the MPDES compliance schedule, the city's preferred alternative is to construct a biological nutrient removal (BNR) treatment system on the site of the city's existing treatment facility. The proposed scheduled has construction beginning in 2015 and taking approximately 18 months to complete. The BNR system will enable the city the ammonia limit of 1.0 mg/1 at the discharge pipe. The proposed project will reduce degradation of Old Maids Coulee and Cut Bank Creek and improve water quality.

Applicant Name	Daly Ditches Irrigation District
Project Title	Hedge Canal Water Conservation

Project Abstract

The Daly Ditches Irrigation District (DDID) in Ravalli County serves 1,845 irrigators and 14,653 acres via a system of nine canals. The Hedge Canal Water Conservation Project will involve improvements to one of DDID's largest canals. Hedge Canal serves approximately 6,108 acres or roughly 42% of the DDID.

This canal improvement project will include installation of approximately 2,425 feet of canal liner along a section of Hedge Canal leaking irrigation water. This section of the canal is also on a very steep slope with slope instabilities along the downhill side. By lining this section of the canal, seepage will be eliminated, thus decreasing the risk of a catastrophic slope failure and loss of surface water delivery to irrigated lands.

In addition to canal lining, this project will also place a staff gauge near the upstream extent of this project, enabling DDID to measure and manage flows in its canal. A fish screen was installed on Hedge Canal in 2010 upstream from this project. This fish screen diverts an unknown portion of the flows out of the canal and back into the Bitterroot River. The DDID has no means to measure the amount of flow downstream from the fish screens. This leaves the DDID with no indicator of how to operate the fish screen.

This project has been identified as a high priority by the DDID staff and Board of Commissioners. By completing this project DDID will be conserve water lost to seepage, preserve its ability to deliver water by stabilizing ditch banks, and increase its ability to manage flows.

Applicant Name Denton, Town of
Project Title Water System Improvements

Project Abstract

Denton's water system is supplied by a central water system consisting of a deep well and spring source in a tributary to Coyote Creek. Water from the springs is blended with water from the well to reduce nitrate levels. Water is then treated with polyphosphate for iron sequestration and disinfected with gas chlorine before being fed into the 185,000-gallon, 93-year-old storage tank. From the tank, water is gravity fed through about 3.5 miles of 10-inch cast iron main to the distribution system. The distribution system consists of 2-6-and 8-inch diameter polyvinyl chloride (PVC) and cast iron pipe mains and 8-inch copper services. Water usage is metered with approximately 175 residential and commercial services serving approximately 256 residents (2010 census).

Denton is under a Montana Department of Environmental Quality (DEQ) Administrative Order on Consent (AOC) to repair seals between the storage tank walls and roof, and to eliminate holes in the access hatch, which are entrance points for contamination. In addition the old cast iron transmission main is undersized and is believed to be the main contributing factor to the 60% lost and unaccounted for water in the system. Furthermore, only one single transmission main conveys water from the supply and storage to the distribution system. When the transmission main is out of service for repairs, the entire town is out of drinking water and firefighting capabilities. This situation creates a serious public health and safety issue for the community.

The proposed project includes replacing the leaking, undersized transmission main and constructing a new 290,000-gallon buried concrete water tank. Replacing the transmission main will provide conservation benefits, as it will significantly reduce the current system leakage of 22 million gallons per year. Construction of a new transmission main from the tank to the town's distribution system also results in a redundant feed into town. In addition installation of a radio telemetry system to control operation of the water supply and storage facilities improves management of a beneficial resource. Overall, the project conserves and preserves the natural resource serving the town, improves management of the system, and eliminates threats to public health and safety.

Applicant Name	Dillon, City of
Project Title	Water System Improvements

Project Abstract

Two 10-inch cast iron pipes within a pipe bridge crossing the Beaverhead River are the major transmission mains supplying water to Dillon. The bridge and mains are old and in poor condition. During spring runoff and seismic events, the mains and the bridge are in danger of significant damage, leaving the city without much of its water supply. In winter, the pipes must be monitored daily to ensure they have not frozen or moved out of alignment. In the past, when the pipe has moved, the lead joints have separated leaving them in danger of breaking. If they broke, it could take weeks for the city to replace the mains, leaving the city without a reliable water supply for residential, commercial, and fire-fighting. If these mains or the bridge were to fail, about 40% of the city's potable well supply and 57% of the city's reservoir storage capacity would be lost.

The project will replace these two critical pipes with one 18-inch main. Between the Beaverhead Pipe Bridge and the bridge on Ten Mile Road, the main will be installed on the northwest side of Ten Mile. At the bridge on Ten Mile at the Beaverhead River, the main will be directionally drilled under the river. On the east side of the county bridge the main will cross the asphalt and run along Ten Mile. From the county bridge to the I-15 bridge, the main will be installed along the southeastern side of Ten Mile. Within I-15 right of way, the main must be encased. Along the Interstate bridge to Rail Road Street, the main will be installed between I-15 and Rail Road Street and connect to existing mains. This will provide the city with a reliable water supply to meet all city needs.

Applicant Name East Clark Street Water and Sewer District
Project Title Wastewater Collection System

Project Abstract

The East Clark Street residents in East Helena have been plagued by aging onsite septic systems of questionable quality. The district received one Notice of Violation and nine septic systems have been replaced. Several lots do not have room for a replacement drainfield if the current drainfield fails.

When an existing septic system fails, some property owners will have a hard time developing a replacement system that meets current design standards and regulations. One property owner drilled a new well onsite which did not meet setbacks from existing drainfields and was forced to abandon the well did forced the business to close. Because of limited lot size property owners had to install a drainfield in their driveway and create another road around the drainfield to get to their house.

Three public water supply systems exist within the district, private wells serve all other residences. Average nitrates found in the groundwater wells range from 2.32 to 3.47 mg/l and have a maximum nitrate range of 2.69 to 3.87 mg/l. These values indicate the effect of septic systems on groundwater and its possible contamination.

The district's new 2014 Wastewater Preliminary Engineering Report (PER) provides planning for the proposed solution of installing conventional gravity sewers and connecting to the East Helena wastewater system. The proposed solution will protect groundwater in the area by decommissioning existing septic systems.

Applicant Name	East Bench Irrigation District
Project Title	Main Canal Gate Automation

Project Abstract

In 2009 the East Bench Irrigation District (EBID) completed a Capital Improvements Plan (CIP), condition assessment, and prioritization of improvements for their irrigation facilities. The top 10 improvement projects in this priority ranking focused on rehabilitation of the check structures and gates of the East Bench Main Canal. In 2010, the EBID began the process of implementing repairs to these facilities. To date, repairs and upgrades have been made to three of these priority projects, with documented renewable resource benefits. The EBID is seeking funding for the design, procurement of materials, and construction of similar repairs and upgrades to three additional structures: the Gun Club Check, Carter Creek Siphon, and Wilson Creek Siphon. Improvements planned for these facilities include replacement of antiquated gates with modern equipment; installation of new gate actuation, control and automation mechanisms; and development of new solar power facilities to provide electricity for the new systems. A key objective of the project is to provide a system capable of maintaining a constant upstream water level, which will allow the system to respond automatically to changing flow conditions in the canal. Completion of this project will increase the operational efficiency of the EBID system, improve the ability of the EBID to control and administer their water, develop new beneficial and sustainable uses of renewable energy, improve public safety, and provide a reduction in warm water return flows to the Ruby River. The technical feasibility of the project is assured, as similar projects have been successfully completed in recent years on other EBID facilities. Renewable resource benefits of this project are both real and quantifiable; estimated benefits are based on actual values measured from previous implementation projects. The project will conserve water, improve water management, develop renewable energy, preserve water quality, and improve public safety.

Applicant Name	Fallon County Water and Sewer District
Project Title	Wastewater Collection System

Project Abstract

The Fallon County Water and Sewer District lacks all essential sewer services, including a centralized sewer system and a wastewater treatment and disposal facility. Wastewater management is accomplished by individual landowner using various configurations of septic tanks and gravity drain-fields – most, or all, of which was installed before regulations. The district's network of seepage pits, cesspools, and metal septic tanks with drain fields are failing. A majority of these systems are not suitable for continued use and are jeopardizing the public's health via groundwater contamination and the surface-ponding of sewage.

The proposed project has already gathered the cooperative and financial support of Fallon County. Moreover, the Baker is willing to connect the district to the city's wastewater treatment system. The district finally has an opportunity, with the help of the State of Montana, to rectify wastewater issues within its boundaries. State funding is needed to cover the project's budget shortfall. If adequate grant funds are not obtained, which would allow for installation of the district's wastewater collection system, long-term prospects for landowners are grim. Landowners would be forced to continue utilizing a deficient and unsafe method of sewage collection and treatment until they are formally stopped. At that point, the district will no longer be able to sustain existing homes or businesses – an unacceptable outcome. While groundwater and public health are at risk, community and economic growth are out of the question.

Applicant Name Flathead Basin Commission
Project Title Flathead Basin Watershed Plan

Project Abstract

The Flathead Basin is home to the largest freshwater lake west of the Mississippi and the economy and ecology of the basin is inextricably tied to the clean water produced by this headwaters landscape. The most fundamental renewable resource - water - benefits not only the Flathead, but much of western Montana. Downstream users in the Clark Fork and Columbia Rivers Basin systems reap the benefits of the clean water emanating from the Flathead Basin. Therefore, protecting surface waters, and the often interconnected groundwater supplies, is of critical importance.

The Flathead watershed plan strategically focuses on areas where:

- (1) a small investment in funding and energy will yield significant dividends in both economic and environmental protection; and
- (2) significant data already exist, which will expedite the ability to identify and develop on-the-ground strategies to protect and improve renewable resources.

Working with existing stakeholder groups, the watershed plan will develop strategies designed to:

- Better manage drought in times of water scarcity;
- Identify the most cost-effective wastewater management solutions designed to achieve the greatest improvement in water quality for the dollars spent;
- Facilitate conservation with Burlington Northern and Flathead County representatives to improve rail safety for hazardous materials transport, and facilitate adoption of an effective response plan in the event of a hazardous waste release;
- Expand successful Aquatic Invasive Species (AIS) pilot efforts to develop a more robust AIS prevention program; and
- Create a voluntary certification program for local businesses, similar to that implemented by the Greater Yellowstone Business Partnership, to facilitate development that strives to protect water quality and other natural resources.

The Flathead Basin Commission (FBC) has worked to identify issues which pose the greatest threat to water quality. The watershed plan components identified are "shovel-ready" and will yield significant, timely results.

Applicant Name Flaxville Town of
Project Title Wastewater System Improvements

Project Abstract

Flaxville's wastewater system was constructed in 1975. The collection system uses 8-inch polyvinyl chloride (PVC) pipe to convey sewage via gravity from the town to the treatment system. The treatment system consists of a two-cell facultative lagoon with disposal through an infiltration/percolation subsurface absorption cell (I/P) basin. Since construction, no other improvements have been made to either system. The collection system in Flaxville appears to be in relatively good condition; however, the wastewater lagoon is failing to provide adequate treatment. The 2010 Montana Department of Environmental Quality (DEQ) lagoon inspection report noted "seepage discharge" and "minor evidence of periodic flow in the second cell." The second cell is in very poor condition.

The wastewater system Preliminary Engineering Report (PER) documented and confirmed the deficiencies in the town's wastewater lagoon, including:

- Erosion on the banks of the second cell;
- Excessive wetland vegetation and muskrats burrowing into the banks and compromising the clay liner; and
- Leakage in both cells of up to 31 inches per year, over five times the allowable limit per current DEQ standards. This is allowing approximately 1.43 million gallons of partially treated or untreated wastewater a direct path into area groundwater. Groundwater samples from the town's supply wells have tested above the Maximum Contaminant Level (MCL) for nitrates.

To address other noted deficiencies, the recommended alternative in the PER includes:

- Removing the sludge in the existing lagoon cells; and
- Installing a new PVC liner in the primary treatment cell.

Applicant Name Flaxville, Town of
Project Title Water System Improvements

Project Abstract

Flaxville's water distribution system consists of four wells, a 25,000-gallon storage tower, a treatment plant with softening and nitrate removal media, AC distribution mains ranging from 4-inch to 8-inch diameter, and hydrants for fire protection. The system was first constructed in 1957. The town has recently replaced the old fire hydrants, installed new radio-read water meters, and installed new media in the water treatment plant. However, serious concerns still exist about the condition of the water tower and well pumps.

The major deficiencies within the system include:

- Lack of a secondary power source in the wells, treatment facility, and water tower;
- The well pump in well #1 needs replacement;
- Interior and exterior surfaces of the elevated storage tank need to be sandblasted and recoated;
- Updated handrails and a cage need to be installed around the ladder to bring the tower up to current codes; and
- Inadequate storage to provide fire protection.

The town does not have the financial resources to address all of the system needs at one time. Therefore, it will be important to prioritize replacements.

To address the noted deficiencies, the recommended alternative in the 2012 Water System Preliminary Engineering Report (PER) and the 2014 Amendment includes:

Installing back-up power at the wells, treatment plant, and water tower:

- Installing a new cage around the water tower access ladder and a new handrail around the water tower landing; and
- Installing a new pump in well #1.

The proposed improvements to the distribution system will conserve, manage, and preserve natural resources by eliminating the potential for the water to corrode through and contaminate the system and by placing newer, more energy-efficient pumps in the wells.

Applicant Name Fort Peck Tribes
Project Title Lateral L42-M Rehabilitation, Phase 1

Project Abstract

The Fort Peck Irrigation Project (FPIP) is located along the Milk and Missouri Rivers in Roosevelt and Valley Counties within the southeast corner of the Fort Peck Indian Reservation. The FPIP consists of two distinct irrigation units, the Wiota Unit and the Wolf Point-Frazer Unit serving a combined 13,300 acres. As funding is available, over 1.4 miles of Lateral L-42M will be lined in multiple phases of the overall project.

The Wolf Point-Frazer Unit is supplied by the Frazer Pump Station located on the Missouri River. Water is pumped from this station into the Main Canal which feeds the laterals within the Unit. The current practice of reducing water releases from the dam is inevitable and will continue to make water a valuable commodity to downstream users for the near future.

This project involves Lateral L-42M, supplied by the Main Canal and providing irrigation to the southwestern third of the unit. L-42M is one of the largest laterals within the unit and supplies multiple smaller branch laterals that deliver water to the area's fields. L-42M has an approximate capacity of 110 cfs and an approximate length of 13.75 miles. The Phase 1 Project Area is approximately 1.4 miles downstream from L-42M's starting point.

This project is part of an overall effort to improve functionality and to promote beneficial use of the water pumped from the Missouri River. Once completed, Phase 1 of the canal rehabilitation project on Lateral L-42M will provide tremendous surface water and energy conservation as renewable resource benefits.

Applicant Name Fort Shaw Irrigation District
Project Title Reduce Waste

Project Abstract

The Fort Shaw irrigation District (FSID) is the second largest irrigation project on the Sun River that distributes water to approximately 11,600 acres on 177 farms between the towns of Simms and Sun River. The irrigation project was originally completed in 1908 with few upgrades until 1996 when the district began an aggressive improvement effort including installation of a remote operated head gate, canal lining, conversion of open ditches to pipelines, and installation of measuring devices. Despite all the work, after almost 100 years of neglect, this aging system of 12 miles of canal, 89 miles of laterals, and hundreds of turnouts and cement structures are still in dire need of repair.

The purpose of this project is to reduce waste that causes increased sediment loading into the Sun River, ruins productive farmland, and wastes water needed during dry years. This project will also protect the livelihoods of area farmers and increase long-term efficiency of the FSID system. This project includes two distinct needs and continues the FSID aggressive improvements which are: (1) reduce significant losses from irrigation delivery by lining 2,100 lineal feet of main canal, and (2) major upgrades to Juelson Wasteway reduce significant sediment loads entering Sun River and improve district infrastructure.

The project will reduce FSID water consumption by 3%. Water quality improvements of 5% should be achieved in cleaner return flows from Adobe Creek and Juelson Wasteway into the Sun River. An active monitoring program to document actual improvements is in place.

Applicant Name Foys Lakeside Estates Water and Sewer District
Project Title Water System Improvements

Project Abstract

The Foys Lakeside Estates Water and Sewer District (WSD) is proposing a project to complete upgrades to its water system. A Preliminary Engineering Report (PER) presents findings and also offers recommendations for improvements to ensure protection of public health and safety in compliance with state and federal standards.

The original water system was constructed in 1994. No accurate drawings of the system exist; piping was not properly installed, resulting in numerous problems. In 2011, the district received \$100,000 in Renewable Resources Grant and Loan (RRGL) Program funds to complete the Phase 1 Water System Improvements project, of (replacement of the decaying system). The proposed Phase 2 Improvements project will complete this replacement and will also address the district's problems with leaking, pressure, and flow deficiency.

The proposed project will eliminate leakage along the distribution main and replace the deteriorating service connections.

The project will install meters at each of the residential services to allow the district to monitor and regulate water usage, including irrigation usage. This flow metering will also provide the district the means to quantify conservation and implement a water conservation plan within the area.

A leaking distribution main can allow contaminants to enter drinking water, which could potentially harm the public. The district experiences low water pressure intermittently. If leakage becomes significant, residents could be left without water until the leak was repaired. Replacing the distribution main reduces health risks caused by leaks and prevents the likelihood of significant leaks that could affect public well-being.

Applicant Name Fromberg, Town of
Project Title Wastewater System Improvements

Project Abstract

Fromberg's collection system and Lagoon Cell 1 were installed in 1961. The pump station was replaced with a lift station and Cells 2 and 3 were added in 1990. Since then no major improvements have been made.

The lift station pumps are operating at only half of their design flow and regularly become plugged. The constriction probably caused by deterioration of the check valves in the valve vault. The plugged pumps must be pulled and screens manually cleaned every few months because they completely shut down. The existing lift station does not have a back-up generator.

Despite being designed to discharge, the lagoons rarely discharge. The lagoons leak as much as 4.1 million gallons per year above the allowable rate. The majority of the leakage is from cell 1. This means raw and partially treated wastewater is leaking directly to area groundwater and potentially into the adjacent Clarks Fork of the Yellowstone River.

The problems with the wastewater system can be summarized as follows:

- Collection system condition is unknown;
- Lift station is not functioning properly; and
- Lagoons leak significantly.

The recommended improvements include:

- Cleaning and video inspecting the collection system;
- Rehabilitating the lift station;
- Constructing a two-cell, partially mixed lagoon system followed by a coarse gravel bed reactor;
- Adding ultraviolet (UV) disinfection; and
- Continuing the discharge of treated effluent.

The proposed improvements of the lagoons will conserve, manage, and preserve natural resources by preserving groundwater and surface water from the influence of 4.1 million gallons of raw and untreated wastewater, conserve energy at the lift station, and manage effluent and influent by monitoring flows.

Applicant Name	Gallatin County
Project Title	Septic System Repair Assistance Program

Project Abstract

Gallatin County requests \$125,000 from the Montana Department of Natural Resources and Conservation (DNRC) Renewable Resource Grant and Loan (RRGL) Program to create a septic system repair assistance program. Gallatin County, in partnership with a local organization, will use the grant to loan money to property owners unable to obtain traditional financing. The money will be used to cover design and construction costs associated with upgrading and maintaining noncompliant septic systems throughout Gallatin County.

Aging infrastructure is a problem. Since 1966, Gallatin County has approved 16,600 septic permits. Over 66% of these are at the end of their expectant life. Properly functioning wastewater systems are important to protect human health and to maintain water quality. An average septic system connected to a household can treat up to 300 gallons of household waste every day. If the system is not functioning correctly, the untreated sewage ends up in the groundwater, drinking water, lakes, and streams.

Providing alternative financing options is vital to a successful permitting and compliance program. While Gallatin County notifies property owners when a system upgrade is necessary, the work cannot be completed unless owners have access to funding. It costs between \$6,000 and \$10,000 to fix a failing septic system. Due to the costs associated with the design and construction of a new system, families may lack the financial resources necessary to complete the improvements and may not qualify for traditional financing options.

Gallatin County recognizes the importance of protecting Montana's water resources from pollution and acknowledges that the primary obstacle preventing the completion of septic system upgrades is a financial one. To solve this problem, Gallatin County aims to remove the financial barrier by providing an alternative financing program to qualified applicants.

Applicant Name

Garfield County Conservation District (GCCD)

Project Title

Little Dry Water User's Association, Infrastructure Improvements

Project Abstract

The purpose of the Renewable Resource Grant and Loan (RRGL) Program is to enhance Montana's renewable resources through projects that measurably conserve, develop, manage, or preserve resources. The Little Dry Water User's Association (LDWU), Infrastructure Improvements proposed project aims to accomplish several of those objectives. The LDWU is a reorganization of one of the earliest irrigation developments in Montana. It dates to 1908 when H.N. Gilmore filed on 12,000 inches of water to irrigate about 5,000 acres along Little Dry Creek in Garfield County and built Gilmore Ditch. Numerous expansions and improvements have occurred over the years, most notably in the 1970s with construction of several siphons and turnouts. Although regular maintenance and repair have preserved the system over the past 40 years, the system is exhibiting inefficiencies that must be addressed to maximize benefits to water, soil, and crops. The proposed project will conserve renewable resources by addressing factors responsible for flow loss from the system. This flow loss is limiting the volume of water able to reach the fields which reduces crop and cattle production from its full potential. By correcting these inefficiencies, benefits to renewable resources and the public will be realized with increased crop yields and cattle production which will translate into increased economic activity and tax revenues for Garfield County and the State of Montana. Lastly, the proposed project will preserve natural resources with stabilization of the Little Dry Creek streambank which was damaged during severe runoff in 2011. If left in its current condition, continued erosion threatens a complete loss of the point of diversion, which will eliminate irrigation opportunities for the LDWU.

Applicant Name Glasgow, City of
Project Title Water System Improvements

Project Abstract

The Glasgow water system, supplied by the Missouri River since 1987, serves about 1,500 connections. As calculated in the Uniform Application, there are 1,813 Equivalent Dwelling Unit (EDU)'s (1,288 residential and 525 commercial).

Chapter 5 of the Preliminary Engineering Report (PER) (located in Section 4 of this Renewable Resources Grant and Loan (RRGL) Program application) discusses Glasgow's water treatment, distribution, and storage facilities. Montana Department of Environmental Quality (DEQ)'s Circular 1 outlines minimum requirements and standards for water systems. A number of deficiencies have been identified in the system, mostly related to the aging components (many dating to the 1960s). There is risk for serious failure, including the lack, of a stand-by power source for treating water and providing it to the distribution system. Deteriorating pipe, valves, and equipment could also lead to a catastrophic treatment failure.

The proposed project includes water treatment plant, distribution system, and storage improvements. Within the existing water treatment plant (WTP) building, improvements are planned for the pretreatment and filtration processes (including a building addition, equipment, and electrical and control system upgrades). The distribution system improvements include rehabilitation of an existing booster pump station, upgrading a bulk water station, and replacing roughly 550 feet of 4-inch water line with 6-inch polyvinyl chloride (PVC) pipe. Also proposed is rehabilitation of the exterior coating of the 1.0 milligal (Mgal) metal storage tank. The project outlined in the Preliminary Engineering Report (PER) is technically and financially feasible.

Completion of this project will enhance the functionality of the municipal facilities for the common well-being of the Glasgow community of 3,250 residents. The upgraded water distribution components will help assure conservation; treatment upgrades will assure health and safety; and storage tank rehabilitation (and back-up power supply) will promote not only health, but continued adequate supply to meet peak demand periods and fire emergencies. It will help assure the quality of life for residents, businesses, and recreationists who depend on the system.

Applicant Name Glen Lake Irrigation District
Project Title Costich Drop Rehabilitation, Phase 1

Project Abstract

The Glen Lake Irrigation District (GLID) is applying for funds from the Renewable Resources Grant and Loan (RRGL) Program for the design and construction of the Costich Drop Structure. The proposed project will address issues of water conservation, preservation of residential homes, operational efficiency, and preservation of crop production.

An inventory assessment of the district's infrastructure was completed in February 2012. The assessment outlined a rehabilitation priorities list to guide the district on future infrastructure improvements. The lining of the Rolling Hills Section of the Main Canal was identified as the top priority. That project was made possible by funding from the Department of Natural Resources and Conservation (DNRC) and is expected to be completed in fall 2014. Although the Costich Drop Rehabilitation Project ranked fourth on the priorities list, the structure has since experienced substantial deterioration and is now the top priority for GLID.

A video inspection of the Costich Drop Structure, performed by the GLID, revealed significant pipe collapse in addition to separation at each of the pipe joints. The pipeline is a vital artery in the irrigation system and is responsible for delivering water to 1,171 acres downstream. The existing structure is currently losing 69.4 million gallons of water through the separated pipe joints each year. The water seepage is causing unstable slopes in the Costich Dam and instilling a looming threat of failure. Each year the GLID is required to patch each joint, costing the district more than \$3,000 in annual O&M. It is expected that in the current condition the pipe will fail within the near future. In the event of pipe failure, the loss of crop production will decrease the water users' revenues by \$819,700. Continued use of the structure without rehabilitation will not conserve Montana's resources and does not protect the interests of the district's users.

Applicant Name Gore Hill County Water District
Project Title Water System Improvements

Project Abstract

The Gore Hill County Water District lies in Cascade County approximately 1 1/2 miles south of the Great Falls International Airport and covers approximately 500 acres. It serves 225 households with a total population of 562. The water system consists of two wells, four 50,000-gallon storage tanks, two iron and arsenic removal treatment plants, and approximately 6.5 miles of distribution main consisting of 6-inch and 8-inch piping. The water supply wells are both over 800 feet deep and complete in the Madison aquifer. Water is pumped from the wells, through the treatment plants, and into the storage tanks. Distribution pumps convey water from the tanks into the distribution system to provide system pressures and meet user demands.

The pumping system is very inefficient, resulting in high energy consumption and associated costs. Automation and telemetry controls are not available to effectively manage the water system.

The proposed project includes installing variable frequency drives (VFD) on each of the four distribution pumps. The VFDs will allow the pump speed to match the system demand and provide for a more efficient pumping system and reduce energy consumption. Electrical soft starts will be installed on the two well pumps. The soft starts will allow the pumps to ramp up slowly, eliminating the large electrical demand currently experienced at pump startup. An automatic transfer switch will be installed on the existing backup generator, eliminating the need to manually start the generator in the event of a power outage. A radio telemetry system will be installed in the two pumphouses and the system will be equipped with a dialer. The telemetry system will provide a communication path between the two pumphouses and the dialer will alert the operator to system problems such as power outages, pump failure, etc.

Overall, the project conserves electricity and improves management of the water system.

Applicant Name	Green Mountain Conservation District
Project Title	Improving Water Quality and Fish Habitat in the Vermilion River Watershed

Project Abstract

The project's purpose is to restore a degraded segment of stream and floodplain to improve and protect water quality and native fish habitat in the Vermilion River, a tributary to the Clark Fork River in Sanders County.

Over time, effects of historic placer mining, clear-cutting activities, and roads have altered stream flows, channel stability, fish habitat, and riparian communities in the Vermilion watershed. A 2007 watershed assessment identified Reach 6 as the highest restoration priority, where deteriorating streambanks, limited in-channel energy dissipation, and a nonfunctioning floodplain have caused frequent channel migration, an over-widened channel, decreased woody debris accumulation, reduction in pool frequency, and lack of sustainable riparian vegetation. The project will address these problems at Miners Gulch, a 1,500-foot zone of degraded stream channel and floodplain in Reach 6.

Restoration work will include reshaping the stream channel, installation of in-stream wood and rock structures, reconstruction of floodplain surface, and an aggressive riparian planting program. Using an upstream-to-downstream approach, restoration of the site must occur before any further restoration can take place.

The Vermilion River is one of the primary spawning strongholds for federally-listed bull trout in the entire Lower Clark Fork River ecosystem. Reach 6 typically contains 75% to 90% in the Vermilion River or Statewide produces the highest densities of rearing juvenile bull trout in the Vermilion River drainage.

The project meets the Renewable Resources Grant and Loan (RRGL) Program objectives by conserving soil erosion at the rate of 207 tons/year; supporting state and federal agencies in managing habitat for bull trout and westslope cutthroat trout; developing pools and complex habitat to increase available fish spawning areas and rearing success; developing a healthy floodplain; and preserving Montana's water quality and native fish species by restoring stream and floodplain function.

Applicant Name	Greenfields Irrigation District
Project Title	J-Lake Rehabilitation and Water Quality Improvement

Project Abstract

The Greenfields Irrigation District (GID) covers a large portion of the Sun River Watershed, serving over 83,000 acres of irrigated agriculture. The GID service area covers approximately 7% of the total Sun River Watershed (1.2 million acres). The large spatial coverage of the project necessitates eight ditch riders covering approximately 500 miles of canals and 250 miles of drains. Water delivery to the ends of the project is complicated taking up to four days for released water to reach many areas. Unforeseen shutdowns of individual landowner irrigation systems or multiple shutdowns due to power outages regularly sends large wasteway flows down highly erodible coulees, ultimately discharging into Muddy Creek, a tributary to the Sun River. Not only are these wasteway flows lost from the irrigation system but they also contribute a significant amount of sediment and nutrient loading to Muddy Creek and the Sun River. Wasteway flows into Muddy Creek have averaged 50,000 acre-feet annually over the last 10 years.

The ultimate goal of the J-Lake Rehabilitation and Water Quality Improvement Project is to better manage water resources within the watershed and improve water quality in Muddy Creek and the Sun River by reducing the total amount of irrigation system wasteway flows into the river. The project proposes to increase the storage area in J-Lake by approximately 30 acre-feet in order to store some of the fluctuations in flow. This project has the potential to reduce wasteway flows by 2,735 acre-feet per year. By utilizing GID staff and resources coupled with financial assistance from programs such as the RRGL, the project would be able to reduce severe bank erosion contributing to sedimentation of the Muddy Creek, conserve precious water resources by improving water delivery and application efficiency, and save money for the affected parties.

Applicant Name Harlowton, City of
Project Title Water System Improvements, Phase 3

Project Abstract

Harlowton's three supply wells were constructed in 1941, 1961, and 1975. A new 590,000-gallon storage tank provides operational and fire storage. Gas chlorine and orthophosphate is injected at each well for disinfection and for corrosion inhibition.

The most immediate need in the Harlowton water system is associated with the aging distribution system, 45% of which is the original deteriorated 80-year old cast iron pipe underlying an active Leaking Underground Storage Tank (LUST) site in the center of the city. Up to nine feet of free product (leaded gasoline) floats on top of shallow groundwater. Much of the 25,500 feet of the fragile, leaking cast iron pipe underlies the LUST site.

An estimated 30% to 40% unaccounted water is excessive and threatens natural resource protection and public health and safety. Excessive leakage drives recharge of the shallow contaminated aquifer, causing increased head differential between local shallow groundwater and its discharge point, the Musselshell River. As leakage is reduced through main replacement, the elevation head will decrease and the subsequent contaminant transport mechanism will also diminish. Contamination potential to the drinking water system during breaks is an imminent threat to public health, not only from inflow by the petroleum-contaminated groundwater but also from backflow from household service connections. The proposed project will replace 6,000 feet of cast iron main with ductile iron pipe. The project will eliminate leaking, fragile, permeable pipe in a location where a threat from groundwater contamination exists. As part of the preferred alternative the city will upgrade the chlorine storage enclosure the Thompson Wellhouse to protect operator safety. The proposed improvements will decrease in energy consumption, conservation of beneficial and municipal domestic use of groundwater resources, mitigate contamination of the Musselshell River, and protect operator and public health and safety.

Applicant Name Highwood Water and Sewer District
Project Title Wastewater System Improvements

Project Abstract

In 1999, the Highwood Water and Sewer District rebuilt its wastewater treatment plant (WWTP), replacing the packaged activated sludge system with a three-cell, partial-mix, aerated treatment lagoon system. The existing plant and lift station were reconditioned and rebuilt, and the system is working well, within capacity, and in well-maintained condition.

In 2008, the operator noticed wear holes in the reinforced polypropylene liners of the primary and secondary treatment ponds. On inspection, he discovered that WWTP control structures were partially full of water, most likely from the leaking lagoon liners. Also, gas vents on the north side of the primary pond were piping out fine material from the embankment. Since noticing these problems, the WWTP operator has maintained levels below the visible tears in the liners.

In 2011 the Montana Pollutant Discharge Elimination System (MPDES) permit noted numerical violations in Highwood. A Preliminary Engineering Report (PER), evaluated the status of the wastewater collection and treatment system and identified deficiencies requiring correction.

In addition to the known issues, the PER identified numerous non-working control valves within the system. Replacement would allow for flexible WWTP operation at minimal cost. Issues were also identified with the effluent discharge pipe placement and operation.

The PER recommends:

- Pump out biosolids wet and deliver for disposal at Veolia WWTP;
- Replace primary and secondary treatment lagoon liners;
- Replace control valves and the pinch valve with a plug valve in the dike; and
- Place a check valve on the effluent pipe.

These solutions will address the identified issues, enabling the Highwood district to serve its community and meet compliance schedules and directives included in the MPDES permit and Montana Department of Environmental Quality (DEQ) standards for wastewater system design.

Applicant Name	Hill County
Project Title	Beaver Creek Park Watershed Assessment

Project Abstract

The Beaver Creek Watershed in Hill County is utilized by a wide variety of users and represents a unique natural, renewable resource. The watershed is host to agriculture, reservoirs, and recreational activities on county and Tribal lands. The channel and floodplain of Beaver Creek have been dramatically impacted by flooding in three of the past five years, with damage to streambanks, within the channel, on floodplains and near infrastructure, including the reservoirs.

The proposed project will provide an assessment of the physical conditions and the human activities to develop an understanding of how the watershed is functioning and how aspects of its health could be better managed. The project will necessarily require the involvement of Hill County, the Rocky Boys Tribe, Montana resource agencies, local landowners, and the general public.

The project will identify a number of aspects of the watershed and correlate those elements with improved management planning. Among the characteristics that require defining are channel and floodplain conditions, upland conditions, sedimentation sources, and the roles of manmade structures and activities including water reservoir management. The approach will involve the collection of hydrological data, stream form/function data, riparian and upland health indicators, and information regarding the current management and use practices.

The desired outcome will include multiagency resource management plans and a higher level of function for Beaver Creek.

Applicant Name	Hot Springs, Town of
Project Title	Wastewater System Improvements

Project Abstract

The Hot Springs' wastewater collection system was installed in the 1940s and consists of vitrified clay pipe (VCP), concrete pipe, and polyvinyl chloride (PVC) pipe. These materials are susceptible to infiltration from groundwater through cracked pipes, broken pipes, offset joints, and poorly installed service connections. Due to the poor condition of pipes, service lines, and manholes, combined with relatively high groundwater, the town has a significant infiltration and inflow (I&I) problem.

The wastewater treatment facility (WWTF) consists of a three-cell partially-mixed aerated lagoons constructed in 1985. The system consists of the three lined lagoon cells, static tube aerators, chlorination, and a rectangular weir for flow measurement, with ultimate discharge to Hot Springs Creek. Some of the equipment at the WWTF has exceeded its design life and needs to be replaced.

The proposed project will reduce infiltration and inflow (I&I) in the collection system, install accurate flow monitoring at the lift station and WWTF, install a screening device at the lift station, replace blowers and air piping supports at the WWTF, replace the inter-lagoon control valves, and install a dechlorination system.

The proposed project will promote conservation of groundwater and reduce energy consumption by reducing I&I in the collection system. It will also allow the town to operate the system more efficiently, ensuring high-quality effluent discharge to Hot Springs Creek. Finally, this project will preserve the quality and quantity of both surface and groundwater by reducing I&I, accurately monitoring wastewater flows, and installing a dechlorination system.

The project will have many economic benefits by providing a stable wastewater system for the town. This will promote greater confidence in development opportunity and improve the local economy. The project also reduces the threat to public health and safety by addressing the deficiencies noted in the Preliminary Engineering Report (PER).

Applicant Name Huntley Project Irrigation District
Project Title Feasibility Study

Project Abstract

The Huntley Project Irrigation District (HPID) is in Yellowstone County, and encompasses the towns of Huntley, Worden, Ballantine, and Pompeys Pillar. The HPID, with U.S. Bureau of Reclamation (USBR) oversight, operates and maintains the irrigation system. Many of the in-line structures within the main canal are over 100 years old. The HPID supplies enough water to irrigate 29,421 acres and services approximately 784 landowners. The primary crops are sugar beets, small grains, alfalfa, other hay crops, and irrigated pasture. The project is a stabilizing influence on the livestock industry in the area, through production of feed crops.

The district's irrigation system includes a rock-fill and concrete diversion dam, approximately 32 miles of main canal, 22 miles of carriage canals, 202 miles of laterals, 186.5 miles of drains, a pumping station with two hydraulic driven pumps, and an auxiliary electric pumping plant. The HPID strives to protect valuable natural resources while providing the best possible service to its users. Unfortunately, the district has neither the staff nor the resources to routinely conduct detailed inspections of all of its deteriorating tunnels, canals, siphons, pumps, crossings, and other parts of this century-old irrigation system.

The HPID is requesting funds through the Renewable Resources Grant and Loan (RRGL) Program to conduct an engineering Feasibility Study for Capital Improvements to ensure the continued viability and operational performance of this valuable irrigation system. This study will identify and prioritize the most pressing present and future maintenance needs. The study will facilitate the preparation of a HPID Capital Improvements Plan (CIP), which will become a powerful resource management, funding strategy, and project selection/implementation tool. The HPID has limited financial resources and realizes the necessity for critical planning tools to better manage and maintain the irrigation system.

Applicant Name	Helena Valley Irrigation District
Project Title	Irrigation Efficiency and Water Conservation

Project Abstract

The Helena Valley Irrigation District (HVID) is applying for funds from the Renewable Resources Grant and Loan (RRGL) Program for design and construction of a pipeline conversion project on Lateral 11.9 Lewis and Clark County. The proposed project will address water and energy conservation, improved irrigation system management, irrigated land development, and water level preservation.

The HVID irrigation system initiates at a pump intake below Canyon Ferry Dam on the Missouri River. From this intake, water is conveyed via pipeline, tunnel, and canal to the Helena Valley Regulating Reservoir. The main HVID irrigation canal originates at the southwest edge of the Helena Valley Regulating Reservoir, and Lateral 11.9 diverts from the main canal approximately 500 feet downstream from the reservoir outlet structure. The primary focus of the proposed project is to address significant water seepage losses that occur within the initial 4,600-foot section of Lateral 11.9. Since the HVID has continually sought to improve the irrigation system through increased water conservation efforts and improved management measures, conversion of the initial 4,600-foot section of Lateral 11.9 to a pipeline is a main priority for the HVID.

Water records maintained by HVID staff indicate that Lateral 11.9 loses 64% of all water diverted to the lateral. Site visits and research of historical soil data indicate that the presence of well-drained soils is the primary cause of water seepage loss along the lateral. The conversion of the initial 4,600-foot section of Lateral 11.9 will effectively eliminate seepage along this section of the Lateral and will conserve an estimated 137 million gallons (420 acre-feet) of water each year. As a result, implementation of the proposed project will provide significant renewable resource benefits including water conservation, energy conservation, improved irrigation management, increased crop production, irrigated land development, and water level preservation.

Applicant Name Hysham Irrigation District
Project Title Re-Lift Canal Improvement

Project Abstract

The Hysham Irrigation District (HID), in Treasure County near Hysham, intends to complete the Re-Lift Canal Improvement Project to provide multiple renewable resource benefits related to improved irrigation water delivery and management.

The HID provides water for 36 irrigators and approximately 6,200 acres of row crops, small grains, and hay. The HID pumps water from the Yellowstone River into the main canal using three, 350-HP pumps. A second pump station lifts a portion of the district's water right into their secondary Re-Lift Canal using three, 100-HP pumps.

The HID is seeking funding assistance for final design and construction of a project to improve water delivery and provide increased water management on an approximately 8,600-foot reach of the Re-Lift Canal. The proposed project reach is adversely graded, leading to poor flow characteristics that limit the efficiency of water deliveries and increase seepage losses. These issues also result in inefficient pump station operation and increased energy usage.

In addition, the same reach of the Re-Lift Canal has too few control structures to effectively manage water surface elevations for irrigation deliveries for adjacent landowners. A single check structure provides water surface elevation control for a series of five irrigation turnouts spaced over approximately 5,500 feet of canal.

The HID Re-Lift Canal Improvement Project proposes to re-grade 8,600 feet of the Re-Lift Canal and install additional control structures to provide for improved operating efficiency, reduced seepage losses, and better management of irrigation deliveries. The resource benefits of this project include energy conservation, improved surface water management, and surface water conservation.

Applicant Name Hysham, Town of
Project Title Water System Improvements

Project Abstract

The town's water system was built in 1915 with the latest major improvements in 1991 and 2008 when the Water Treatment Plant (WTP) was upgraded, and an extension of the infiltration gallery for the water supply was built. Per the 2012 Optimal Corrosion Control Treatment (OCCT) the town added orthophosphate to its treatment and removed copper piping at the WTP. The town's water storage is a 60-year old leaking 100,000-gallon elevated tank. An inspection in 2012 found the interior 100% corroded. In January 2014, the tank started leaking through one of the steel panels in the bottom. Following review by a structural engineer, the tank has been determined in danger of catastrophic failure.

In summary:

- The tank is in danger of catastrophic failure;
- The town recently had a tank repair team attempt a patch in the tank (lasted less than one-hour);
- The tank is severely undersized to meet DEQ-1 requirements;
- Over 30% of the treated water is unaccounted for in the distribution system;
- Three cast iron mains in the system are severely corroded and delivering brown water to users; and
- No back-up power exists at the WTP.

The proposed project would:

- Replace the failing 100,000-gallon tank with 300,000-gallon elevated storage tank;
- Supply back-up power to the WTP with a generator;
- Replace remaining leaking cast iron mains in the distribution system;
- Purchase radio-read meters for all users (one-third of existing have failed); and
- Conduct leak detection survey of the distribution system to identify leaking mains.

Replacement of old cast iron mains and adding meters promotes water conservation and reduces demand on the Yellowstone River. Replacing the tank before to catastrophic failure saves energy and water that would result from having a no-storage system with continuous pumping and pressure (water) releases throughout the system.

Applicant Name Jefferson County
Project Title Sugar Beet Row Wastewater System Improvements

Project Abstract

The residential community along Sugar Beet Row, adjacent to the southern boundary of Whitehall, is served by a sewage collection system that originally discharged to a community drainfield. In the early 1980s, the drainfield failed and a pipe was installed to discharge the effluent directly to Big Pipestone Creek. The discharge violates the Montana Water Quality Act (WQA) and presents a serious threat to public health and safety. The proposed project will rehabilitate the existing collection main and install a new transmission main to connect the system to the Whitehall's municipal wastewater system.

Eliminating the direct discharge of untreated sewage to Big Pipestone Creek benefits a renewable and sustainable natural resource and meets the objectives identified in 85-1-602, MCA. The project will reduce degradation of the creek and significantly improve water quality, as well as reduce the associated risks to public health and safety. It is documented in the Environmental Protection Agency's (EPA) National Enforcement Initiative (FY 2011-2013), that sewage pollution can kill aquatic life and create algal blooms that can suffocate fisheries; that raw sewage carries "disease-causing microorganisms [that] can cause fever, abdominal cramps, diarrhea, vomiting or infections of open cuts or rashes; and that human exposure to raw sewage can lead to "infections of the internal organs, such as hepatitis.

Big Pipestone Creek is part of the Upper Jefferson Watershed and is therefore classified as B-I, which requires support of uses that include drinking, culinary, and food-processing purposes after conventional treatment; bathing, swimming, and recreation; growth and propagation of salmonid fishes and associated aquatic life, waterfowl, and furbearers; and agricultural and industrial water supply. The proposed improvements will help restore the creek to a quality capable of supporting its intended uses.

Applicant Name	Jordan, Town of
Project Title	Wastewater System Improvements

Project Abstract

Jordan is requesting Montana Department of Natural Resources and Conservation (DNRC) Renewable Resources Grant and Loan (RRGL) Program funds to address system deficiencies, resulting in discharge of partially treated effluent into Big Dry Creek. Jordan's wastewater system is not meeting discharge limits, because nonresidential waste loadings from local industrial dischargers are increasing influent biochemical oxygen demand (BOD) loads. Big Dry Creek lacks sufficient flow to adequately dilute the discharged effluent. This project is necessary for Jordan to comply with state and federal discharge limits while still providing a necessary, safe service to current and future residents. Benefits of this project will be the implementation of a total retention system to eliminate the need for Jordan to discharge any effluent into Big Dry Creek. Benefits of the project support the RRGL Program's goal to preserve renewable resources by eliminating discharge of partially treated effluent into a nearby water source.

Serious harm to the environment, as well as public health and safety issues, are likely to occur if issues with the wastewater treatment system are not resolved. If the Jordan wastewater system continues to discharge into Big Dry Creek, partially treated effluent will continue to be released into this water source. This situation poses a health threat to the residents of Jordan, as well as to the people, livestock, and wildlife living in the vicinity of Big Dry Creek.

Applicant Name	Judith Gap, Town of
Project Title	Wastewater System Improvements, Phase 2

Project Abstract

Numerous deficiencies exist throughout the remainder of the original wastewater collection system. All of the original manholes were constructed with brick and mortar materials and with inadequate and unsafe access. The condition of the pipe during sewer televising has ruled out rehabilitation as a repair option; total replacement will be necessary.

Sewer main problems include structural damage, plugging, sewage backup, exfiltration, evidence of clay tile debris in the system and major failure. The highest public health and safety concerns sewer main plugging and sewage backup. The poor condition of the original sewer pipe allows raw sewage to infiltrate the local shallow aquifer, posing threat to groundwater.

The proposed project includes replacement of sewer main and appurtenances in the alley between Meagher Street and Highway 191 between 2nd and 4th Avenues; in the alley between Highway 191 and Lewis Street between 3rd and 4th Avenues; and along Louis Street between 1st Avenue and the County Road.

The final project material quantities will include 1,860 lineal feet of 8-inch sewer main, 270 lineal feet of 4-inch sewer service pipe, 27 service connections, and five concrete manholes.

Applicant Name Kevin, Town of
Project Title Wastewater Facility Improvement

Project Abstract

In 2005 the town of Kevin completed replacement of its town's failing wastewater treatment system with a new upgraded three-cell lagoon system with a hydraulic detention time of 180 days. This, along with newly installed Solar Bee mixers, should have alleviated frequent violations to the town's Montana Pollutant Discharge Elimination System (MPDES) effluent discharge permit requirements with respect to biochemical oxygen demand (BOD). The Solar Bee mixers continually need repairs and are often frozen and do not work in winter. Since 2010, Kevin has received numerous letters of violation as well as fines.

Montana Department of Environmental Quality (DEQ) issued an Administrative Order of Consent (AOC) to the town in September 2010. Since, Kevin has tried numerous solutions to lower BOD limits, such as sewer bugs, larger aerator bubbler, etc. to comply with the MPDES effluent discharge permit.

Original design included installation of ultraviolet (UV) disinfection after additional data had been collected from the upgraded Kevin wastewater treatment facility. UV manufacturers stressed the importance of sampling effluent so the UV equipment could be sized properly to handle the range of total suspended solids (TSS) and fecal coliform concentrations. After trying various alternatives, DEQ is requiring installation of UV equipment at the Kevin wastewater facility.

Aside from treatment system deficiencies, which includes the problem of partially treated wastewater discharge into a dry lake bed (an ephemeral drainage of the Marias River); a potentially serious threat to public health and the environment exists.

Applicant Name Laurel, City of
Project Title Water System Improvements, Phase 3

Project Abstract

Laurel's original distribution system was installed in 1908, followed by sedimentation basins in the mid-to late 1930s. With the exception of the clearwell building installed in 1997, the remainder of the treatment plant was constructed in the 1950s.

The city has completed Phase 1 and 2 Water System Improvements but there are still unresolved issues.

Phase 3 Water System Improvements generally will include:

- Replacement of the flocculation and sedimentation basins with covered basins;
- Automatic sludge removal in the sedimentation basins;
- Installation of a settled water pumping station to serve industrial uses; and
- Relocation of the Cherry Hills booster station.

Additive alternatives for the Phase 3 Water System Improvements project may be completed as funding allows and may include all or portions of the following:

- Replacement of the backwash/sludge ponds;
- Replacement of the 250,000-gallon backwash water storage tank;
- Completion of miscellaneous improvements at the water treatment plant including: check valve and actuator replacements; new variable frequency drives (VFD) and raw water pumps; blower for filter air scour; and clearwell building ventilation; and
- Completion of security improvements such as moving the road and installing fencing, door security, and cameras.

Proposed improvements will conserve, manage, and preserve natural resources. Changes in the water treatment plant design will conserve backwash water while at the same time allowing the city to manage the plant to better meet future needs within the system. In addition, improvements will preserve the quality of water supplied by preventing contamination through covering the flocculation/sedimentation basins as well as potential cross-contamination in the distribution system due to low system pressures and resulting backflow.

Applicant Name Lewistown, City of
Project Title Riverdale Addition Wastewater Collection Improvements

Project Abstract

The 1903 Riverdale Addition within the Lewistown has approximately 40 permanent residences, with municipal water service and metering. It is the last remaining area within the city with individual on-site septic systems for wastewater disposal. Lot sizes are too small for drainfield replacement areas, and shallow groundwater and nearby Big Spring Creek are vulnerable to septic pollution. One resident was unable to start a business (meat cutting) due to the lack of adequate wastewater disposal.

In collaboration with Fergus County, Lewistown commissioned a 2014 Preliminary Engineering Report (PER) to evaluate Riverdale's wastewater situation, plus a separate project to provide new sewer and improved water service to the Fairgrounds. The PER compared wastewater management options for Riverdale, and recommended conventional gravity sewers connecting to an existing city interceptor. Cost estimate is \$993,800 (plus \$19,500, half of the PER cost related to Riverdale). Funding of Riverdale sewers is proposed with \$125,000 Renewable Resources Grant and Loan (RRGL) and \$500,000 Treasure State Endowment Program (TSEP) grants. A \$368,800 INTERCAP loan will finance the balance.

It is infeasible to repay the financed share of the project with only the small user base in Riverdale, and no developer remains who can contribute financially. Per the goal in its 2006 Growth Policy to "convert on-site systems to central sewer service," the city is pursuing this project as a "system" improvement. Resulting rate impact to city sewer users will be approximately \$1 per month per Equivalent Dwelling Unit (EDU) for 15 years. Expanding the user base by adding Riverdale residents will augment sewer revenues by \$12,000 annually, after the small additional operation and maintenance (O&M) cost for the new sewers is paid. Sewerage may also encourage new commercial growth along Highway 191 in Riverdale, creating potential collateral economic benefits.

The project has strong support from both Lewistown citizens and Riverdale residents, as demonstrated during the project's public involvement process.

Applicant Name Liberty County Conservation District
Project Title Marias River Bank Stabilization, Phase 2

Project Abstract

The Liberty County Conservation District (LCCD) is applying for funding through the Montana Department of Natural Resources and Conservation (DNRC) Renewable Resources Grant and Loan (RRGL) Program for design and construction of a riverbank stabilization project along the Marias River approximately 4.43 river miles downstream from Tiber Dam. The proposed project will stabilize the riverbank to improve management of the Marias River corridor, preserve private land, preserve Pugsley Bridge and Pugsley Road, develop fish and wildlife habitat, and preserve the water quality and fisheries of the Marias River.

The Marias River Bank Stabilization Project, Phase 2 is approximately 15.5 miles southwest of Chester, and 338 feet downstream from the Pugsley Bridge. The LCCD is committed to improving this section of the Marias River due to extreme erosion of the riverbank. Among other similar conservation projects to improve the Marias River, the LCCD completed Phase 1 of the Marias River Bank Stabilization Project in spring 2013. The current highest priority for the LCCD is to stabilize 335 feet of riverbank and eliminate this extensive erosion source.

It is estimated that the 335-foot section of riverbank discharges 4,241 cubic yards of sediment per year into the Marias River. Field investigations conducted by engineering personnel have confirmed severe erosion occurring along this stretch of river and have identified the flow condition, channel velocity, channel geometry, and unstable soils as major factors contributing to the erosion. The erosion has negatively affected water quality; threatened to erode adjacent county roads, bridges, and private land; and increased the cost of operating and maintaining the riverbank. The proposed riverbank stabilization will provide significant renewable resource benefits including conservation, management, development, and preservation of the LCCD's land and water resources.

Applicant Name	Lincoln County
Project Title	Measuring and Modeling the Effects of Mining and Associated Reclamation Activities on Selenium and Nitrate Inputs to Lake Koocanusa

Project Abstract

Large-scale mountain top coal mining in southeastern British Columbia (BC) is currently degrading water quality and fisheries in Lake Koocanusa, a large reservoir located primarily in northwestern Montana (Lincoln County). During 2012, Selenium loads to the reservoir from coal mining exceeded 29,000 pounds, representing a five-fold increase in loadings since 1992. Montana Department of Environmental Quality (DEQ) has listed Lake Koocanusa as threatened by Selenium, and listed the water body under Section 303 (d) of the U.S. Clean Water Act. Also of concern are increasing nitrate loads to Lake Koocanusa associated with explosive residues from mining. Mine expansions in southeastern BC over the next 30 years are likely to increase Selenium and nitrate loads to Lake Koocanusa beyond current levels. Based on data collected by Montana Fish, Wildlife, and Parks (FWP), current Selenium loads are accumulating in resident fish populations in Lake Koocanusa. Communities and tribes have requested intervention by state and federal governments to address both the current impairment of Lake Koocanusa and increased threats from future mine expansions.

The overall objective of the proposed project is to utilize new and existing monitoring sites in Lake Koocanusa and the contributing watershed to model selenium and nitrate loads entering and leaving the reservoir, as well as estimating the concentration of these constituents within the reservoir. Specific objectives of the proposed project are to: (1) utilize the U.S. Geological Survey (USGS) LOAD EST software in combination with water quality and discharge data routinely collected at three existing inflow sites and one outflow site to model daily selenium and nitrate loads entering and leaving Lake Koocanusa; (2) use the above loadings, in conjunction with daily storage/fore bay elevation data, to estimate reservoir concentrations at both at the international border and fore bay based on presumed reservoir behavior and mixing characteristics; and (3) develop a publically accessible Web page to display the contaminant load and reservoir modeling results from objectives 1 and 2 in real time.

The proposed project will construct the necessary monitoring, modeling, and Web architecture to determine if the combined impacts of ongoing and future BC mine expansions, in combination with planned water treatment facilities, are adequate to stabilize and eventually reduce contaminant loads and concentrations to Lake Koocanusa. The publically available, Web-based platform will allow for easy access to the model results by all interested parties, including state and federal regulators, while also providing a visual metric to evaluate the short-and long-term trends of contaminant loadings in the context of mine expansion and active future remediation activities. Without the monitoring and modeling infrastructure developed from this proposal it will be difficult for regulatory agencies and the general public to determine if contaminant loadings entering and leaving Lake Koocanusa are stabilizing or decreasing, or if additional assimilation capacity in the reservoir is available for future natural resource development in either the United State or Canada.

Applicant Name Livingston, City of
Project Title Wastewater Treatment Plant Upgrade

Project Abstract

Livingston is proposing to upgrade the existing wastewater treatment plant (WWTP) originally constructed in 1960 and subsequently upgraded in the early 2000s. The facility treats Livingston's wastewater for ammonia, phosphorus, nitrates, and total dissolved solids. The treated wastewater is discharged into the Yellowstone River downstream from town. Since the last upgrades, the total pollutant load has significantly increased and using the pollutant load increase trends, the facility is estimated to meet capacity by 2030. Because the facility is not capable of meeting future flows, loads, and/or permit limitations, several processes must be upgraded.

The project cost is estimated to be approximately \$13 million dollars and will ensure a cleaner water supply from the Yellowstone River for communities downstream from Livingston and will also produce cleaner effluent which will benefit the ecology of Yellowstone River.

Livingston has applied for Treasure State Endowment Program (TSEP) and Renewable Resource Grant and Loan (RRGL) funds. Any costs not paid for with grant dollars will be paid for with a Water Pollution Control State Revolving Loan (SRF) and repaid with user rate increases over the next 20 years.

The Preliminary Engineering Report (PER) for this project completed an environmental assessment and concluded a finding of no significant impact on the environment.

The PER recommends upgrades supported with a budget estimate that includes necessary preliminary and final engineering costs. Project management will be assumed by several City of Livingston staff. The public works director will be responsible for oversight of the contracted engineering and construction firm. The city's grants coordinator will complete grant management and reporting. The finance director will manage budgets, expenditures, change orders, and the State Revolving Loan.

Applicant Name Lockwood Irrigation District
Project Title Lockwood Pump Station Rehabilitation

Project Abstract

The Lockwood Irrigation District (LID) is applying for grant funding through the Renewable Resource Grant and Loan (RRGL) Program for the design and replacement of Pump 3 within the Lockwood Pump Station. The proposed project will improve pump station efficiency; improve water resource management; conserve water in the Yellowstone River; and conserve energy at the Pump Station.

A facility inspection was conducted by an engineering firm and LID staff in April 2014 to supplement an energy audit conducted by Northwestern Energy. The Inspection included a visual inspection of the pump equipment including impellers and casings. During the inspection, visual evidence substantiated degradation of the impellers which would contribute to the inefficiencies found during an energy audit. Pump equipment is in poor condition and will likely fail within five to eight years without replacement. From an operations position the LID has drastically changed in demographics over the last three decades. The district would benefit from increased pumping flexibility through installation of variable frequency drives (VFD) and new pumping equipment. Ideally the LID would be able to eliminate Pump 1, which is now oversized for the demand of the Lower Canal. Installation of slightly larger pumps with VFDs will provide the flexibility to eliminate Pump 1 and conserve water and reduce energy.

Proposed improvements will result in improved management and conservation of the energy and water resources, a primary focus of the LID. Potential failure of the pump station could mean a loss of irrigation water to agricultural producers and residents of Lockwood resulting in a revenue loss of \$569,050 to the community through lost production and increased residential water bills.

Applicant Name Lower Musselshell Conservation District
Project Title Delphia-Melstone Water Users Association South Pre-Tunnel Lining

Project Abstract

Lower Musselshell Conservation District (LMCD) is applying for funds from the Renewable Resource Grant Loan (RRGL) Program for design and construction of an irrigation rehabilitation and betterment (R&B) project for the South Canal, part of the Delphia-Melstone Water Users Association (DMWUA) irrigation project. The proposed irrigation R&B project would provide DMWUA with seepage control, increased water management efficiency, water conservation, and increased crop yield.

In 2011, the Pre-Tunnel South Canal experienced significant damage due to the 2011 Musselshell River flood. The priority section for R&B of the Pre-Tunnel South Canal is a one-mile section with visible seepage water flowing from the canal embankment.

A 1,600-foot section of the Pre-Tunnel South Canal has been identified as the initial irrigation canal lining R&B project by DMWUA. The project would include design and construction of approximately 74,000 square feet of geomembrane canal liner. Estimated seepage reduction would be approximately 10% for the 1,600-foot canal section or 500 acre-feet/year. The increased water system efficiency allows for delivering additional irrigation water, more irrigated acres, and improvements to Musselshell River fishery habitat. Public safety is also significantly improved to prevent a canal embankment failure due to the seepage.

Total project cost is estimated at \$130,000. No environmental, cultural, or historical resources would be negatively impacted if this project were constructed. The local economy would benefit from the project as a result of increased crop production and improved water and land resources.

Applicant Name Lower Yellowstone Irrigation District #1
Project Title Lower Yellowstone Wasteway

Project Abstract

The Lower Yellowstone Irrigation Project (LYIP) is applying for funding through the Montana Department of Natural Resources and Conservation (DNRC) Renewable Resources Grant and Loan (RRGL) Program for two wasteway rehabilitation projects. The proposed projects are in Richland County, Montana, and Dawson County, North Dakota. The proposed improvements will retrofit two wasteway structures with new gates to improve management of the irrigation system, conserve water diverted from the Yellowstone River, preserve water quality of return discharge to the Missouri River, and improve control of the flow within the irrigation system.

The proposed project is located in both Montana and North Dakota. The nearest town is Fairview, Montana, approximately 10 miles south of the proposed project area. The LYIP is dedicated to improving its irrigation delivery system and has identified the two wasteway rehabilitation projects as high priorities within the canal system.

The proposed improvements would conserve approximately 559.8 million gallons of water diverted from the Yellowstone River per year. Field investigations conducted by an engineering firm confirmed the poor conditions of each wasteway structure. Addition, the wasteways are in remote areas hard to access with wooden check boards that require manual operation, and making them very dangerous and difficult to operate. The water level is kept intentionally low in order to ensure the safety of operators and keep the structural integrity of the canal safe from drastically changing flow conditions. The proposed project would significantly benefit Montana's renewable resources through conservation, management, development, and preservation of the LYIP's land and water resources.

Applicant Name Malta Irrigation District
Project Title Exeter Siphon Replacement

Project Abstract

Malta Irrigation District operates and maintains an irrigation system in the Milk River Basin. MID provides water to approximately 44,600 acres. MID is requesting a Montana Department of Natural Resources and Conservation (DNRC) (Renewable Resource Grant and Loan) grant to assist with final engineering and construction of the Exeter Siphon Replacement Project.

The proposed project includes replacement of one main canal siphon conduit on Dodson North Canal which supplies water to the northern portion of MID. An engineering study evaluated the structure and determined necessity of rehabilitation or replacement.

The Preliminary Engineering Report (PER) evaluated numerous alternatives to rehabilitation or replacement of conveyance structure. After review of the proposed alternatives, MID determined Alternative 5 would best meet district needs: A section of canal will be installed and diversion structure modified to bypass Exeter Creek flows.

Implementing the preferred alternative will avoid catastrophic failure of the existing structure thus preserving irrigation use of this crucial renewable resource. The PER estimated current conditions of the structure results in approximately 30 acre-feet of pipe leakage and overflow water losses per day. This water savings can be passed on to other irrigation districts within the Milk River Basin, to other users such as Bowdoin National Wildlife Refuge, or left in the Milk River to improve instream flows for downstream species, such as pallid sturgeon.

Overall, this project will:

- Maximize renewable resource benefits and enhance conservation, preservation and management opportunities. It also ensures continuation of public and citizen benefits;
- Utilize current MID staff and equipment to complete a majority of construction and reduce costs;
- Increase flow rate downstream from the siphon and diversion structure;
- Prevent further scour of and damage to canal structure; and
- Reduce water resource losses from siphon pipe leakage and overflow from flows exceeding pipe capacity.

Applicant Name	Malta Irrigation District
Project Title	Peoples Creek Diversion Dike Rehabilitation

Project Abstract

The Malta irrigation District (MID) is sponsoring the Peoples Creek Diversion Dike Rehabilitation Project for the neighboring Ereaux Water Users Company (EWUC). MID is applying for funds from the RRGL Program for design and rehabilitation of the Peoples Creek Diversion Dike. The proposed project will conserve the local water resource; improve water resource management in Peoples Creek; preserve soil quality in the EWUC; and improve public safety through flood mitigation.

Site inspections conducted by an engineering firm in April and May 2014 found the facility in disrepair with four identified failures in the diversion dike. These failures have led to flooding of the EWUC U.S. Highway 2, and the MID's Dodson Main Canal. Dike failure has negatively impacted nearly 1,000 acres within the EWUC. Floodwaters have overtopped U.S. Highway 2 creating public safety concerns for travelers along one of Montana's primary highways. Finally, floodwaters have overtopped and damaged both the MID's Dodson Main Canal headworks as well as the main canal itself. Rehabilitation of the Peoples Creek Diversion Dike is necessary to effectively route People Creek and its floodwaters into the Milk River.

Proposed improvements will result in conservation, improved water management, preservation of soil quality, and improvement to public health and safety. Water will be conserved and water management will be improved through effective routing of Peoples Creek into the Milk River. Soil quality will be improved and preserved through elimination of flooding of the EWUC. Public health and safety will be improved along U.S. Highway 2 through effective routing of Peoples Creek and prevention of floodwaters from overtopping the highway. The project will have a secondary benefit of allowing for the optimization of production on nearly 1,000 acres resulting in \$97,500 in increased revenue.

Applicant Name	Medicine Lake, Town of
Project Title	Wastewater Improvements

Project Abstract

This reclaimed water project will rehabilitate the existing lagoons and lift station comprising Medicine Lake's reclaimed water treatment system.

The town has identified several concerns with the system. Leeward lagoon banks are eroding. Water balance study indicates the lagoons are leaking partially treated water into the surrounding ground and groundwater, and the lagoons contain excessive biosolids. These concerns threaten local surface and groundwater supplies along with local wildlife habitat.

Repairing and reshaping the eroded lagoon banks and lining the lagoons will reduce or eliminate the amount of reclaimed water seeping into the groundwater and Big Muddy Creek. These modifications will also reduce the possibility of the lagoon bank failing and allowing the lagoons to empty into Big Muddy Creek. Removal and disposal of the biosolids from the lagoons will return the lagoons to their original capacity. This will allow the lagoons to more efficiently and effectively treat the reclaimed water before discharge to Big Muddy Creek and the Medicine Lake National Wildlife Refuge. This refuge is important to native plant species, wildlife, and recreation, including swimming.

Applicant Name	Mile High Conservation District
Project Title	Blacktail Creek Non Point Nutrient Management

Project Abstract

Nutrient levels in a water body are a critical parameter to sustain healthy aquatic life and fish populations. Blacktail Creek in Butte is a tributary to Silver Bow Creek which in turn flows into the Clark Fork River. The nutrient level in the Blacktail Creek is high enough to impact not only the health of the stream but also it might influence nutrient loading by point sources in downstream locations. The Montana policy for nutrient loading under total maximum daily load (TMDL) has established numeric nutrient standards. The point sources are under pressure to control nutrient loading while contribution from nonpoint sources could be significant. This is a pilot project to explore the possibility of nutrient trading between point sources to nonpoint sources. Blacktail Creek will be the pilot study area. Nutrient levels, loading, and sources will be characterized along the creek to develop best management practices (BMP). The selected BMPs will be implemented to reduce the nutrient loading to Blacktail Creek. Even after implementing a very expensive municipal wastewater system upgrade, the ability to meet the required TMDL goals in Silver Bow Creek will not be met due to the non-point contribution from Blacktail Creek. Therefore, the proposed project is vital to maintain the TMDL goals for nutrients. Major objectives of this project are: evaluating nutrient levels, loading, identifying sources of Blacktail Creek, developing best management practices, exploring the point source to non-point source nutrient trading potential.

Applicant Name Milk River Irrigation Joint Board of Control
Project Title Hydrometric Gauging Station Expansion and Upgrade

Project Abstract

The Milk River Irrigation Project Joint Board of Control (JBOC), established in 1999 with assistance from the state of Montana encompasses eight irrigation districts from Fresno Dam near Havre to Vandalia Dam near Glasgow. The JBOC is composed of 10 board members representing Alfalfa, Fort Belknap, Zurich, Paradise, Harlem, Dodson, Malta, and Glasgow. The JBOC, along with the U.S. Bureau of Reclamation (USBR), Tribal Water Rights, and municipalities, make up the majority of water users throughout the basin, an area covering over 300 miles and encompassing 140,000 irrigated acres.

Manage the water supply and distribution of water within the Milk River Project, JBOC and the USBR, with technical assistance from DNRC, installed remote gauging stations at the head of each district's main canal. The stations are linked by satellite and available to the public through Reclamation's website. The importance of the gauging stations evolved to serving today as a river management and accounting tool to keep track of each district's diversions and water allotments.

The JBOC operates and maintains 11 gauging stations along the Milk River Project. The JBOC is proposing to expand the system to 15 gauging stations. A Renewable Resource Grant and Loan (RRGL) for \$125,000 will enable the JBOC to expand the current system, thus enhancing conservation, management, development and preservation of our limited water resources.

The proposed upgrades will increase water user communication, forecast water demands, and track water conservation measures. Information provided by this system is critical to planners, water users, resource managers, and stakeholders. Precise planning for the uses of the Milk River is vital to conserving its water supply and preserving the agricultural-based economy of Montana's Hi-Line.

Applicant Name Missoula County
Project Title Buena Vista Trailer Community Wastewater System Improvements,
Phase 1

Project Abstract

The Buena Vista Trailer Community, one mile west of Missoula International Airport was established in 1953 as an RV park. Residents gradually moved permanent housing onto the site. Thirty-eight mobile homes are connected to the community's public water and sewer infrastructure.

Of most concern to the trailer community is the aging wastewater treatment system. An unlined, three-cell lagoon receives raw sewage from the 1,100 gravity collection main. The lagoons are located in an unnamed ephemeral tributary to LaValle Creek and have never been observed at full capacity. The lagoons are probably leaking untreated, or inadequately treated, sewage and stormwater into the stream channel and alluvial deposits of the tributary, with subsequent contamination of LaValle Creek and deeper, more extensive valley fill deposits. Sewage-contaminated surface water runoff could eventually discharge to the Clark Fork River approximately 3.5 miles downgradient. Deeper valley fill deposits serve as an aquifer and as a domestic drinking water source for nearby downgradient private wells. La Valle Creek is a tributary to the Clark Fork River.

The preferred alternative is to eliminate the wastewater discharge by constructing a lift station and approximately 1,200 feet of 4-inch HDPE forcemain to connect to an existing nearby city of Missoula 8-inch gravity sewer main. This alternative also includes decommissioning a private septic tank/drainfield and subsequent installation of about 160 feet of sewer service to city sewer.

The proposed project will be split into two phases.

- (1) Construct a lift station and approximately 1,200 feet of 4-inch HDPE forcemain to connect to an existing nearby city of Missoula 8-inch gravity sewer main; and
- (2) Decommission a private septic tank/drainfield and install about 160 feet of sewer service to city sewer and abandon the lagoons, as additional funds become available.

Applicant Name	Missoula County
Project Title	Mill Creek Restoration

Project Abstract

The Mill Creek Restoration Project will restore approximately 450 feet of Mill Creek in the Frenchtown area of Missoula County. Recent streambank erosion has chewed away over 790 cubic yards of riparian area shifting the stream 30 feet horizontally. It is now eating away at a pasture deemed "Farmland of Local Importance". The eroded material has filled in one of two culverts recently installed by the county under a Rural Special Improvement District using tax dollars from local residents. Reduced capacity in the culverts has increased the stream velocity in the remaining structure to a point that fish passage to 73% of the drainage is blocked. This project will rehabilitate the culverts to simulate the natural streambed. Fish species, including rainbow, brown and westslope cutthroat trout and the native mountain whitefish, will benefit from an expanded habitat. In addition, bioengineering methods will be used to stabilize the streambank. The bioengineering design will include "soft" armoring of the streambank utilizing willow plants, dogwood and cottonwood trees, and other riparian plants to naturally stabilize the streambank. These plants, along with conifer fascines, will provide fish and aquatic habitat below the water level and shade to cool the stream above the water. Bioengineering streambank stabilization will also be used downstream from the crossing. Unstable river hydraulics caused by sedimentation of the upstream eroding streambank threatens irrigation infrastructure, power poles and a domestic water supply. Stabilizing the streambank and rehabilitating the culverts will improve stream hydraulics downstream. Resource benefits associated with this project are preservation of aquatic habitat through removal of a fish barrier and restoration of a stream channel and preservation of irrigation land through stabilization of the bank.

Applicant Name	Missoula County Weed District
Project Title	Montana Biological Weed Control Coordination

Project Abstract

The Montana Biological Weed Control Coordination Project was established to provide the leadership, coordination, and education necessary to enable land managers across Montana to successfully incorporate biological weed control into their noxious weed management programs. Noxious weeds infest about 8 million acres of Montana, about 9% of the state, with knapweed alone costing roughly \$42 million per year in direct and indirect costs. Biological weed control (biocontrol) is the deliberate release of specialized natural enemies from the weed's native range to reduce the weed's abundance or spread in its introduced range. Unlike most weed control, the majority of expense related to biocontrol (approximately \$1-2 million/insect) go to prerelease studies where each insect is thoroughly tested to ensure that it will not cause damage to native or beneficial species. Once approved and released, biocontrol insects spread at no cost to the landowner, with established insects like those for spotted knapweed providing \$8 of benefit (to agriculture for every \$1 spent on prerelease research, In comparison, landowners see a return of \$2.50 for every \$1 spent on herbicide control.

Biocontrol is an underutilized renewable resource capable of improving the quality of many of Montana's other public resources. Biocontrol activities occur inconsistently in Montana with no standardized monitoring of collection, distribution, release, and efficacy. Objectives of this project are to organize the distribution of biocontrol insect across Montana, establish an online mapping program on the location of insect releases and insect distribution, establish a statewide monitoring system, and assist land managers in implementation of the monitoring system for the lands they manage. By doing so, this project will lead to the more efficient and sustainable use of this renewable weed control tool for the direct benefit of Montana's citizens and its natural resources.

Applicant Name	Missoula Irrigation District
Project Title	Water Conservation

Project Abstract

The Missoula Irrigation District Water Conservation Projects aim to provide multiple renewable resource benefits to surface water, irrigation within the urbanizing Missoula Valley, and riparian habitats. The two sections of ditch comprising this project are geographically separated with the Gharrett Street portion in Missoula city limits and the 3rd Street portion in both Missoula city and county. Since 1901, the Missoula Irrigation District operated its ditch system to deliver surface water flows to residents within its boundaries. The district is seeking assistance for design and construction of improvements to approximately 1,100 lineal feet of ditch between the two locations.

Seepage and surface water losses have been a continual issue, even causing flooding of adjacent properties. Underfunded improvement efforts have been implemented in portions of the project areas without engineering considerations and have resulted in limited, short-term success, but also created issues of reduced hydraulic capacity and increased maintenance. Topographic survey information has indicated that approximately 44% of Gharrett Street and 34% of the 3rd Street reach have adverse grades to flow direction. As a result of these capacity restrictions and seepage issues, flow measurements have indicated that between 31% and 14% respectively of the surface water flow entering the sites is lost by the end.

With proper improvements to the identified reaches this project could result in increased surface water flows for the use of 41 irrigators for Gharrett and 106 irrigators for. 3rd Street. Proper design and implementation should eliminate flooding in adjacent lots and improve water conservation, allowing an increase in surface water flows returning to both the Clark Fork and Bitterroot Rivers, and benefiting acres of adjacent riparian.

Applicant Name
Project Title

Missoula, City of
Buckhouse Bridge Outfall – Stormwater Treatment Retrofit

Project Abstract

The Bitterroot River flows on the southwestern side of the Missoula Valley and is valued for its abundant fishing and boating opportunities. As a navigable stream near Missoula with easy take-outs and put-ins, it is a popular public use area. By 2016, the corridor will also be home to a new trail system which will connect the Missoula to a 45-mile trail to Hamilton.

Two very busy commercial four-lane highways are served by a piped stormwater conveyance that terminates in an undersized detention basin. This basin creates an anaerobic environment that retains some amount of sediment which is then resuspended and flushed into the river after each subsequent rain. Stormwater coming into and leaving this pond is virtually all highway-related runoff. This project seeks to retrofit this pond with a hydrodynamic separator (HDS) to remove sediment, metals, debris, oil and grease.

The Bitterroot River is listed as an impaired water for lead, sediment, temperature, and alteration of streamside covers. Analysis of pond sediments this spring shows lead, copper, and zinc levels elevated above background. Semiannual stormwater sampling since 2007 has exceeded in Montana Department of Environmental Quality (DEQ)-established stormwater values; including, copper, nitrogen, phosphorous, oil and grease, zinc, chemical oxygen demand, and total suspended solids.

By installing a treatment device at the end of this system, this project will (1) preserve the natural resource benefits of the Bitterroot River, (2) improve public health and safety by removing a mosquito-breeding, bacteria-laden, anaerobic pond near a walking trail, and (3) remove contaminant sources to the Bitterroot River. It will enhance the economic values that the Bitterroot River brings to Missoula by demonstrating to recreationists, conservationists, and sportsmen and women, that this community places high value on its renewable resources.

Applicant Name
Project Title

Missoula, City of
Caras Park Outfall – Stormwater Treatment Retrofit, Phase 1

Project Abstract

Downtown Missoula is a hub of activity. Numerous restaurants, retail stores and government and financial institutions call this area home. The Clark Fork River runs through downtown and brings beauty and business to the community. Downtown Missoula's stormwater system discharges to a popular recreation site called Brennan's Wave adjacent to Caras Park. Untreated stormwater and anything else that is washed down curbs and alleys within this 62-acre drainage area is concentrated and discharged through a 30-inch concrete pipe at this location. Contaminants include, grease, bacteria, sediment, metals, and garbage. This project seeks to install end-of-pipe treatment to mitigate impacts to human health and safety associated with stormwater and to enhance renewable resource benefits of the Clark Fork River.

This project seeks to retrofit an aging collection system with technology to better protect the river from common stormwater contaminants. The proposed technology includes an inline treatment system using a hydrodynamic separator (HDS). Stormwater runoff during warm periods contributes warm water to the river which negatively affects fisheries. To mitigate the problem, this project is designed with the goal of adding an infiltration gallery. By infiltrating stormwater after it passes through the HDS, high-temperature water has the opportunity to cool and recharge the aquifer. In addition, this cooled water can replenish late-season low river flows when cool, steady inputs are vital to the river's health, rather than being discharged and adding to the flood threat.

The proposed project provides numerous renewable resource and public health and safety benefits. Surface water quality of the Clark Fork is preserved, aquatic and wildlife habitat in the river is preserved, management of the stormwater is achieved, and public health and safety is enhanced by reducing exposure to high levels of contaminants in a high-use area.

Applicant Name
Project Title

Montana Department of Environmental Quality
Montana Time-of-Travel Interactive Web Application for Montana

Project Abstract

Most Montana residents rely on streams and rivers for recreation, livelihood, and municipal water supply. Computations of instream travel times are invaluable in the event of potential contamination via spills from trucks, rail, and pipelines carrying various materials through Montana. In addition, estimates of chemical concentrations can assist emergency response personnel in developing spill response plans and determining likelihood of damage to human health and property.

The Montana Time-of-Travel (MTTOT) application will be developed as a tool within StreamStats, an interactive, Web-based map application originally developed for providing streamflow statistics for gaged and ungaged locations in Montana. The ability of StreamStats to estimate streamflows anywhere in Montana is necessary for the development of MTTOT, which requires hydrologic data for estimating instream travel times.

Using MTTOT, users can estimate travel times and concentrations in the downstream direction for any location. MTTOT users will be able to point and click on any stream shown on the map where a potential contaminant has entered a stream. MTTOT will use regression equations and real-time gage information available in StreamStats to compute travel times for points of interest downstream from the user-selected point. Users will be able to enter the amount and type of the spilled contaminant and receive estimates of the concentrations for selected downstream locations.

Instream travel times and concentrations will help inform and guide emergency response coordinators and personnel in the event of a spill or in developing spill response plans. MTTOT will provide estimates to the user on how long it will take for the contaminant to reach and pass by major streams and rivers, municipal water supply intakes, and location of possible spill contamination.

Applicant Name Montana DNRC – Water Resources Division
Project Title East Fork Rock Creek Main Canal Lining

Project Abstract

The East Fork Rock Creek Main Canal is southwest of Philipsburg in Granite County. The 7.7-mile long main canal is part of the Flint Creek Water Project which also includes the East Fork Rock Creek dam and reservoir, and four other delivery canals. The project is owned by the Montana Department of Natural Resources and Conservation (DNRC) and operated by the Flint Creek Water Users Association (WUA).

The canal was constructed in 1938 to supply irrigation water to the Philipsburg Valley. Water from the canal irrigates nearly 38% of the land under irrigation in the Philipsburg Valley. Consequently, the economy of the region is linked to water deliveries from this canal.

Water from the canal irrigates ranch and farmland, recharges the flow of Flint Creek, supports local wildlife habitat, provides trout fisheries, and offers a recreational resource to hunters and fishermen.

In 2010 the DNRC installed new monitoring sites along the canal to help quantify seepage rates. Data collected in 2010 and 2011 show seepage loss in the reach of canal from the headgate to the East Fork Siphon can be as high as 30 acre-feet per day, with a seasonal average of 15 to 20 acre-feet per day. This considerable quantity of water is lost through the highly pervious canal berm. Water lost through seepage dissipates into the ground with no beneficial use.

The proposed project would install canal liner along a 1,200-foot pervious section of this canal and return this precious resource to beneficial use.

The DNRC is requesting a grant of \$125,000 for installation of the canal liner to prevent seepage, protect recently constructed canal infrastructure, protect private property, and conserve water for more beneficial use to landowners and the general public.

This grant was approved during the last cycle. Before DNRC could begin the project the siphon just below this canal section floated out of the ground. DNRC needed to repair the siphon immediately. An approved exigency letter authorized using the previous grant to make the emergency repairs. This application is to make the canal repairs proposed and approved in the previous application.

Applicant Name Montana DNRC – Water Resources Division
Project Title Musselshell Basin Instrumentation

Project Abstract

The Musselshell Basin Instrumentation Project will install instrumentation and telemetry for collecting "near-real-time" reservoir elevations, inflows, and outflows at state-owned dams in the Musselshell River Basin. This data will allow for better management of stored water, conserve water usage and assist in meeting decreed and contract water rights in the Musselshell River through cooperative flow management throughout the entire basin.

State-owned dams in the Musselshell Watershed include:

- Bair Dam (North Fork of Musselshell River headwaters);
- Martinsdale Dam (off-stream dam with supply canal from South Fork of Musselshell River); and
- Deadman's Basin Dam (off-stream dam with supply canal from Musselshell River).

A reservoir instrumentation and telemetry system network will allow the Montana Department of Natural Resources and Conservation (DNRC) and local water users to better manage existing reservoirs in the basin. Access to "near-real-time" reservoir data benefits all Musselshell Watershed Coalition (MWC) members, including DNRC. This project is consistent with MWC's mission to benefit water users and the river through basinwide cooperative management of the Musselshell River. Coalition partners include three Water Users Associations; Mosby Musselshell Watershed Group; four conservation districts; and state and federal agencies including DNRC, DEQ, FWP, USGS, and NRCS. MWC created GIS models of irrigation infrastructure within the watershed. MWC could incorporate "near-real-time" reservoir inflow, outflow, and elevation/storage data into its existing GIS management system to improve water management in the basin.

This project supplements existing instrumentation at state-owned dams in the Musselshell Basin to create an automated instrumentation system to measure, record and provide telemetered reservoir data, making dam operation more efficient. It enhances Montana's renewable resources by managing and preserving tributary storage; conserving water; preserving natural resource-based recreation and fish/aquatic habitat; and by improving water use efficiency. If the Musselshell obtains chronically dewatered status, the proposed measuring devices should meet the Department's requirements under 85-2-113.(4).

Applicant Name Montana DNRC – Water Resources Division
Project Title Willow Creek Access Road Rehabilitation

Project Abstract

Willow Creek Reservoir is an on-stream reservoir in Madison County. The Willow Creek Dam is approximately 10 miles upstream from the town of Willow Creek and four miles east of Harrison. Willow Creek Reservoir is a high-hazard dam due to its potential for loss of life in the event of a dam failure.

The dam and gate tower are typically accessed by a ranch road along both the west side east sides of the reservoir. Not much more than a two track, the road is about 6 miles long. Melting snow and spring storms make the road soft and slick at various locations and access to the dam difficult or inaccessible. The reservoir fills at spring runoff and it is filling and the most important time to be able to access the dam. Due to road conditions, spring access is difficult and sometimes impossible. At some road locations the road slopes adversely around curves while climbing. In an emergency, heavy equipment necessary to remediate potential problems would have difficulty getting to the dam.

To have safe and reliable access to the dam and to allow for construction equipment to more readily access the dam in an emergency, the State Water Projects Bureau (SWPB) proposes to widen the road, install culverts, and lay down a gravel base on specific portions of one access road. The road improvements will allow for better and more rapid access to the dam to manage the reservoir in case of emergencies. The project will also enhance dam safety.

Applicant Name Neihart, Town of
Project Title Water System Improvements

Project Abstract

Neihart has serious issues with their water distribution, storage and supply systems:

- The town has been in violation of turbidity standards in their source water which they draw from O'Brien Creek. To remedy this issue they constructed a temporary intake at Shorty Creek to draw water during times of high turbidity in O'Brien Creek. The U.S. Environmental Protection Agency (EPA) and Montana Department of Environmental Quality (DEQ) have issued an Administrative Order with a schedule to replace the existing intake in Shorty Creek with a permanent, engineered intake; and
- Water production records compared with metered water records from Neihart's users indicate that about 85% of the town's treated water is unaccounted. One shallow-buried main at the north end of town is left open to run continuously to prevent freezing. This must be buried deeper and capped in order to reduce wasted water. Other, old undersized mains proposed for replacement are also suspected to be leaking and should be replaced. Phase I addresses the most critical issues with the distribution system.

The town has a 40,000-gallon clearwell at the treatment plant. This storage for domestic firefighting needs to provide average day demands plus fire flow. During high summer demands, domestic needs. If a fire were to occur, there would be little or no water. The only way to fight a fire would be to divert raw water from the reservoir into the system. Such a diversion would introduce contaminants which would require a Boil Order until lines were flushed and bacteriologically tested. To meet DEQ requirements, the town needs about 120,000 gallons of additional storage. A storage tank constructed near the treatment plant will provide adequate storage for domestic and firefighting needs.

Applicant Name

Park Conservation District

Project Title

Upper Shields River Fish Barrier and Road Improvements

Project Abstract

The Shields River Watershed is one of the few remaining basin-level strongholds for Yellowstone cutthroat trout (YCT) and the mostly nonhybridized fish reside nearly throughout the watershed's streams. Non-native brook trout present a dire threat to the persistence of YCT, especially in headwaters. Extensive survey and study of movements of fishes indicate brook trout are rapidly invading the upper Shields River Watershed, displacing YCT. Without intervention, this population of YCT will disappear within a few decades. This grant request addresses construction of a fish barrier at the downstream extent of the project area. The fish barrier would be a high wall built inside a culvert where the Shields Loop Road crosses the Shields River. The wall would present a barrier to fish attempting to move to the waters upstream. Agency partners would remove brook trout in streams above the barrier, leaving a secure refuge for YCT. If opportunities to implement preservation downstream arise, the impassable element could be removed, allowing for expansion of secured habitat. This action is one component of a much larger project aimed at conserving, improving, and preserving renewable natural resources in the Shields River Watershed. The Gallatin National Forest has improved roads and crossings as part of an ongoing \$3.2 million project. These road improvements will benefit water quality by reducing sediment loading to streams. The combination of the barrier and installation of aquatic organism passage (AOP) culverts upstream will provide a cold, clean, connected refuge for YCT of approximately 25 stream miles. The improved roads will benefit a host of recreationalists, including, hikers, hunters, anglers, motorized recreationalists, and mountain bikers, and provide economic gain to the local economy. Large AOP crossings are more likely to survive large floods than conventional culverts because they have a longer service life with lower maintenance costs. Gallatin National Forest has also improved recreational facilities in the area, including construction of trailheads, trail improvements, campground improvements, and public education bulletin boards. Combined, these efforts will benefit fish, water quality, and recreational use.

Applicant Name	Petroleum County Conservation District
Project Title	Musselshell Watershed Prioritized Projects Initiative

Project Abstract

The primary objective of the Musselshell Watershed Prioritized Projects Initiative (MWPPI) is to generate Preliminary Engineering Reports (PER) for four construction projects that are critical for management of Musselshell River water resources. This effort is part of the Musselshell Watershed Coalition's (MWC) effort to manage the watershed's resources for beneficial use. The MWC is the strongest partner in this project and its mission is to improve water quality and water quantity in the Musselshell Watershed through collaboration among private and public partners. Improved water quality and increased water quantity can be achieved only through effective conservation, management, development, and preservation of the water resource.

This effort continues to build on past water enhancement projects. The Musselshell Watershed Plan (MWP) identify potential projects within the watershed and to prioritize them according to their importance, feasibility, benefits/impacts to the watershed's beneficial resources, and costs. Critical components in the process for creating the MWP are the project-ranking criteria and prioritization of identified projects using these ranking criteria. Criteria will be based on resource and citizen benefits that each project holds. This process will help ensure a high likelihood for success of the top four projects. As a result, water quantity and quality, fisheries, wildlife, flood mitigation, and river function can all be positively impacted.

This project will significantly conserve, develop, manage, and preserve renewable natural resources in Montana. The proposed project meets the statutory objectives of 85-1-602 (a), MCA: feasibility, design, research, and resource assessment studies.

Applicant Name	Polson, City of
Project Title	Wastewater System Improvements

Project Abstract

Polson's wastewater treatment facility (WWTF) includes a four-cell aerated lagoon with a surface water discharge into the Flathead River. The facility was constructed in 1981 and has several deficiencies. Lagoon dikes are eroding and nearing failure. The facility has an algae and duckweed problem during spring and summer. The facility has no means for disinfecting effluent. The facility cannot meet anticipated water quality regulations related to discharge of nitrogen and phosphorous. In September 2008, the U.S. Environmental Protection Agency (EPA) issued an Administrative Order for Compliance (AOC) because the city failed to comply with 2001 and 2007 National Pollutant Discharge Elimination System (NPDES) permits. Because of the AOC, the city was fined \$40,200 and directed to increase its monitoring efforts. The city's current NPDES permit became effective in January 2012 and requires the city to implement disinfection to comply with limits for effluent *E. coli* bacteria by July 1, 2017. Since issuance of the current NPDES permit, the city has exceeded numeric discharge limits and failed to meet percentage removal requirements for biochemical oxygen demand (BOD) in 13 instances (maximum pH once, and *E. coli* in 12 instances). The city proposed to decommission the lagoon and construct a mechanical treatment plant in the footprint of the lagoon's first cell. The proposed wastewater treatment system improvement project will provide an 11-acre area for future reclamation and development of green space, wetland areas, and wildlife habitat; preserve water quality, fish and aquatic habitat, and public recreational areas in the Flathead River; and, administer engineering studies that identify alternatives for renewable resource projects.

Applicant Name Pondera County Conservation District
Project Title C-5 Canal Conversion

Project Abstract

The Pondera County Conservation District (PCCD) is applying for funds from the Renewable Resource Grant and Loan (RRGL) Program for the design and completion of a canal-to-pipeline conversion project on the C-5 Canal within the Pondera County Canal and Reservoir Company (PCCRC) irrigation system. The proposed project will address water conservation, crop production improvement, irrigation management, and irrigated land development within the system.

The C-5 Canal is roughly one-mile southwest of Lake Frances near Valier and is supplied from water diverted from Birch Creek. Birch Creek is fed by Swift Reservoir, a capacity of 30,000 acre-feet and owned and operated by PCCRC. PCCRC has proactively addressed water loss throughout entire irrigation system with infrastructure and canal repairs as well as completing system improvements projects. The highest priority for the PCCRC is to address the significant water losses historically occurring within the C-5 Canal. PCCRC water records indicate that a 6,500-foot section of the C-5 canal loses an average of 58.3 million gallons (179 acre-feet) of water annually. Site visits by engineering personnel have confirmed that canal seepage is the primary cause of water loss from within the canal. These water losses have created significant irrigation inefficiencies, lower crop productions, elevated operation and maintenance costs, and undeveloped downstream acres.

The proposed project will provide substantial renewable resource benefits including conservation, management, development, and preservation of the PCCRC's land and water resources. In addition to these benefits, the elimination of water losses result in electricity conservation, improved crop production, and additional developed irrigated acres that could boost revenues in the area by as much as \$333,360 per year. These increased revenues would directly benefit the area's economy.

Applicant Name	Pondera County Conservation District
Project Title	Wasteway Rehabilitation and Water Quality Improvements

Project Abstract

The Pondera County Conservation District (PCCD) in collaboration with the Pondera County Canal and Reservoir Company (PCCRC) have a proven history of storage reservoir water conservation projects aimed at reducing sediment and associated pollutant loads into the Marias River while increasing the company's ability to conserve and manage water resources. Because of the benefits that these demonstration projects have shown, PCCRC is implementing a full-scale, project wide reservoir planning study to identify future wasteway rehabilitation and improvement projects. These projects involve reservoir storage sites aimed at erosion control and water conservation. The PCCD has identified the K-Blowoff Reservoir and pumpback system as the highest priority for wasteway improvements within the canal system.

The underlying cause of the current condition of wasteways within the PCCRC is the high volume wasteway flows that spill throughout the water season, due to the large spatial coverage of the canal system, coupled with the readily erodible soils within Pondera County. Some wasteway flows and subsequent erosion are inevitable. The proposed project would be very effective in addressing the underlying problems.

The PCCRC recognizes the need to conserve and manage its water resources to sediment and associated pollutant loads into the Marias River. The ultimate goal of this Wasteway Rehabilitation and Water Quality Improvements Project is to conserve limited water resources while improving the overall water quality of the Marias River and its tributaries. To achieve these goals this project will provide for design and construction of a storage reservoir and a pumpback station on the K-Blowoff wasteway that will capture approximately 4,000 to 5,000 acre-feet of wasteway flows for the irrigating of existing agricultural fields.

Applicant Name	RAE Water and Sewer District
Project Title	Woodland Park Well

Project Abstract

RAE Water and Sewer District (WSD) west of Bozeman and serves a population of approximately 1,100 full-time residents. The district includes a trailer park, multifamily housing, single-family housing, and commercial properties. Projected population for new annexations and planned development is estimated at 2,200. To serve these new connections, the district will need to increase source capacity by 400 gallons per minute (gpm). Average capacity for the district's five wells is 102gpm. Approximately four new wells will be added to meet the Montana Department of Environmental Quality (DEQ) source capacity standard for groundwater. The Woodland Park Well is the first of the new wells and is scheduled to be put into service in 2016. The well project budget is an estimated \$313,750. A test well has been installed to verify conditions for a production well at the well site. A new water right will be obtained for the well in compliance with the state's water right statutes and rules. A change application will be filed to convert existing irrigation water rights conveyed to the district to aquifer recharge. An aquifer recharge facility will be constructed (not included in the project) and operated in perpetuity to offset surface water depletions over the full calendar year.

Applicant Name Riverside Water and Sewer District
Project Title Wastewater System Improvements

Project Abstract

The district's Wastewater Treatment Facility (WWTF) was constructed in 1975. The WWTF includes of an aerated lagoon (with five helixor aerators), storage cell, package plant with a rapid sand filter and gas chlorination, a polishing pond, and discharge through spray irrigation. The original lagoon construction has never been upgraded. The lift station received some improvements, including a new lid in 2011. The WWTF has not been performing as designed for at least the last 11 years. In the past 11 years wastewater has rarely accumulated in the storage cell due to leakage; therefore the filters, chlorination, polishing pond, and spray irrigation have never been used. The system was most recently reviewed by Montana Department of Environmental Quality (DEQ) in September 2011.

In 2011, an Operation and Maintenance (O&M) Inspection Report was conducted by DEQ. The report found that no water is reaching the holding pond. The DEQ report estimated leakage of 7 million gallons (mg) of partially treated wastewater to the groundwater annually. The PER estimates between 11.8 to 28.7mg of wastewater should be entering the storage cell each year. This groundwater influences the Gallatin Aquifer and East Gallatin River which is currently classified as an impaired body of water.

The proposed project would:

- Disconnect sump pumps from the sanitary sewer system; and
- Construct a 0.75 mile pipeline to connect to a sewer main of Bozeman's wastewater collection system.

The project is essential to protection of the East Gallatin River and the Gallatin Aquifer and provides a regional approach to wastewater treatment by connecting to the Bozeman system.

Applicant Name Rocker County Water and Sewer District
Project Title Wastewater System Improvements

Project Abstract

Rocker's aerated lagoon treatment facility was constructed in 1985. The last major improvements occurred in 1997 when the wastewater treatment facility was upgraded to address recurring discharge permit violations noted by the Montana Department of Environmental Quality (DEQ). The 1997 upgrade was installed for approximately \$250,000 and consisted of a Santac packaged mechanical plant installed as a pretreatment step in advance of the aerated lagoons. The 1997 upgrade enabled the district's wastewater plant to operate in compliance with discharge permit limits until October 2006 when a new discharge permit was issued with more restrictive effluent limits. In 2007 the district began to have occasional discharge permit violations; on May 20, 2011, it entered into an Administrative Order on Consent (AOC) agreement with the DEQ. The AOC requires that the district achieve compliance with the discharge permit. The district has prepared a Preliminary Engineering Report (PER) to find a solution and develop an implementation plan to eliminate future discharge permit violations. In addition to studying the wastewater treatment facility, the PER also evaluated the condition of the district's wastewater collection system. In January 2014, the entire wastewater collection system was video- inspected by a camera crew from the Butte-Silver Bow Public Works Department. No collection system deficiencies were reported.

Rocker's wastewater treatment facility has the following deficiencies:

- The wastewater treatment facility (WWTF) lacks pretreatment screening and flow equalization which negatively impact the operation and treatment efficiency of the Santec packaged treatment plant;
- The Santec packaged plant was installed without waste activated sludge and biosolids handling processes. Excess biosolids wash out of the plant and flow to the aerated lagoons. This sludge loading to the lagoons negatively impacts the aerated lagoon treatment performance resulting in reduced effluent quality;
- The current discharge permit requires year-round disinfection. Previous discharge permits did not require year-round disinfection and the disinfection system was not designed or constructed for winter operation. The disinfection system requires upgrading to allow for year-around operation; and
- New discharge permit limits on residual chlorine are problematic and require either a switch to an alternate form of disinfection (ultraviolet) or installation of a post-disinfection dechlorination process.

Upgrades to the treatment plant to address deficiencies are estimated to cost more than \$1 million. The preferred alternative is estimated in the range of \$600,000 and consists of closing down the district's WWTF and conveying the district's untreated wastewater to Butte-Silver Bow's Metro Wastewater Treatment Plant (WWTP). The proposed project would:

- Upgrade the existing sewage lift station to pump wastewater to Butte-Silver Bow's Metro WWTP instead of the district's treatment plant;
- Install an approximately 2,600 foot force main pipeline to connect the district's sewage lift station to Butte-Silver Bow's Tax Increment Financing Industrial District (TIFID) wastewater pipeline; and
- Demolish and reclaim the site of the existing wastewater treatment facility while salvaging anything of use.

Applicant Name Roundup, City of
Project Title Water System Improvements

Project Abstract

Roundup's original distribution system was installed in 1908. Despite some pipeline replacement, over 38,000 feet of the original cast iron pipe remains in use.

A Preliminary Engineering Report (PER) documented this and numerous other deficiencies in the city's water system, including:

- The 100-year-old cast iron pipe results in an excessive number of leaks each year;
- Deteriorating cast iron water mains in documented leaking underground storage tank (LUST) sites;
- Inadequate fire flow in over 40% of distribution system;
- Inoperable valves on the original distribution system;
- Lack of hydrants and working hydrants inhibiting fire protection;
- Iron concentration 68 times as high as the Secondary Maximum Contaminant Level from the source and a 1-inch layer of rust inside the cast iron mains;
- The rust build-up reduces the capacity of the mains, increases pumping costs, and reduces fire flow; and
- The city loses up to 25% of its pumped water annually from leaking mains.

Water main replacement will be completed over several phases due to funding. The next phase includes replacement of 3,600 lineal feet of main replacement, along with new hydrants, valves, and updating services from the main to the curb stop.

Proposed improvements to the distribution system will conserve, manage, and preserve natural resources by eliminating leaking water from deteriorated cast iron pipes and significantly reducing the energy required for pumping. Proposed improvements will also preserve natural resources by protecting groundwater from chlorinated water by reducing leaks.

Applicant Name	Ruby Valley Conservation District
Project Title	Smith Slough and Smith Ditch Fisheries Enhancement

Project Abstract

The Ruby Valley Conservation District proposes to enhance Smith Ditch and Smith Slough system to meet the following goals: (1) Improve adult fisheries habitat; (2) improve spawning habitat for rainbow and brown trout from the Big Hole River (BHR); (3) Improve water quality by reducing thermal inputs to the lower BHR. Adult habitat in the ditch/slough enhanced in areas overwidened and shallow, and will provide refuge habitat when water conditions in the river are low and temperatures high. The lower BHR lacks tributary streams used for spawning and rearing and Montana Fish, Wildlife and Parks (FWP) has identified the fishery in the river as limited in part by available spawning habitat. The enhancements planned in the slough channel will add approximately 1,600 feet of high-quality spawning areas. The lower BHR suffers from chronic high temperatures in late summer; Montana Department of Environmental Quality (DEQ) lists it as impaired for temperature. Temperature data indicate that during the warm summer, water entering the slough system is returned to the river 2-4 degrees warmer. In addition to fisheries and water quality enhancements, replacing the headgate is a high priority. An irrigation infrastructure study and prioritization was done on all diversions on the lower Big Hole and the Smith Ditch as 3rd of 32 diversions. Regular maintenance is required to get irrigation water to the headgate including extensive excavation of river gravels. Replacing the headgate and moving it to the proposed new location would eliminate the need for regular maintenance and would ensure adequate flows in the ditch for irrigation and fisheries.

Applicant Name	Sanders County
Project Title	Clark Fork River, Plains Reach Bank Stabilization

Project Abstract

The Plains Reach Committee recently conducted an assessment of an 8-mile reach of the Clark Fork River between Henry Creek and Lynch Creek to develop a restoration plan for the entire reach. This study was undertaken to address the accelerated rates of streambank erosion and lateral channel migration observed since the 1997 flood. The study identified additional stabilization along the Plains Wastewater Treatment Plant (WWTP) as a top priority since it is a critical piece of community infrastructure. Approximately 137 feet of riprap was placed on the streambank adjacent to the WWTP in March 2010 to stabilize the outfall location. Bank erosion between 1995 and 2013 occurred over a 715-foot section of bank upstream from the WWTP riprap and a 4,175-foot section of bank downstream from the WWTP riprap, with a maximum retreat rate of 742 feet since 1995 downstream from the WWTP. Streambank stabilization, using a combination of rock riprap and revegetation and bioengineering techniques, is proposed to provide long-term protection for the WWTP. The proposed bank stabilization project along the WWTP is one component of a larger streambank and floodplain restoration effort to restore natural rates of lateral channel migration while protecting critical infrastructure and economically important areas along the Clark Fork River. As an initial step to restore bank stability, funding is requested to develop engineering designs, construction-ready plans, and permitting for a bank stabilization project along the WWTP. The project would extend approximately 715 feet upstream, and approximately 400 feet downstream of the existing riprap.

Applicant Name	Shelby, City of
Project Title	Stormwater Improvements

Project Abstract

Shelby storm drainage system dates to the 1920s with paved curbs and gutter streets that convey stormwater to inlets and ditches. Existing inlets, undersized storm water pipes and inefficient detention ponds pose a serious threat to public health and safety. At the same time, the system causes a tremendous amount of land erosion, destruction of existing infrastructure, damage to properties, and negative economic impacts.

With stormwater drainage addressed, rain will not threaten the health and safety of those who live, work, or travel in these drainage areas. Damage to water inlets, roads, rail lines, and rights-of-ways will be significantly reduced, conserving the integrity of infrastructure and channeling runoff to designated areas suitable for saturation and channel movement. The project will also develop proper water flow with adequate pipe and inlet systems and allow for development of stock ponds for livestock grazing along the water channel. Improvements will address the threat of damage to homes, properties, roadways, and rail lines because of undersized pipes and inlet capacity. Improvements will also manage the large pools of stagnant water in populated areas, potentially causing health threats to humans and animal.

As part of the 2015 biennium, Shelby was awarded Treasure State Endowment Program (TSEP) funding to initiate this stormwater project. City leaders have been working in partnership with the Montana Department of Transportation (DOT) and have expanded the scope of work. Renewable Resource Grant and Loan (RRGL) monies would serve as another funding source for the project.

Applicant Name Sidney Water Users Irrigation District
Project Title High Canal Rehabilitation, Phase 5

Project Abstract

The Sidney Water Users Irrigation District (SWUID) is applying for funding from the Renewable Resource Grant and Loan (RRGL) Program for the design and construction of Phase 5 of the High Canal Conservation Project in Districts 1 and 2. The proposed project will conserve water, improve irrigation management, preserve water quality, and improve agricultural production.

Between 2003 and 2004, the Natural Resources Conservation Service (NRCS) Sidney Field Office worked with the SWUID to determine the extent of water loss High Canal. The results of water loss measurements and field investigations found severe seepage and conveyance losses throughout the canal. Over the past eight years the SWUID has implemented four of five overall phases in the pipeline conversion project, resulting in millions of gallons of water conserved. The priority for the SWUID is to complete the fifth and final phase..

Field inspection in fall 2013 showed vegetative overgrowth, seepage areas, and poor conveyance conditions. Removing the open canal and installing the last leg of the High Canal Pipeline will complete the closed conduit system, eliminate seepage, improve irrigation conveyance efficiency, conserve water pumped from the Yellowstone River, and eliminate Total Maximum Daily Loads (TMDL) concerns associated with return flows to the Yellowstone River. Water measurements and calculations show water loss of 4.5 cfs through the remaining open portion of the High Canal, totaling up to 1,230 acre-feet per year. The proposed project will eliminate seepage and conveyance losses through the remaining section of the High Canal while improving water management and water quality.

The proposed project will conserve water, Improve management, and preserve water and soil quality. Seepage and conveyance losses create an annual revenue loss of \$66,830 due to reduced crop production. Implementation of the proposed project will result in increased irrigation efficiency, increased crop yields, and restore lost revenues to the local economy.

Applicant Name Sidney, City of
Project Title Wastewater System Improvements

Project Abstract

In 1959 the city constructed a two-cell lagoon system that discharged to the Yellowstone River. When construction was done, the second cell did not hold water. From 1960 to the 1970s the wastewater system was largely ignored by the state. To date, it does not meet state design criteria.

The city has grown approximately 25% in the last two years and 50% since 2010, due to the Bakken oil boom. In January of 2013, the city was put on an Administrative Order on Consent (AOC) and must come into compliance within four years. The city cannot meet the discharge permit issued in February 2014 without completely rebuilding its treatment system.

The proposed project will change the existing facultative wastewater treatment system to an aerated lagoon system with discharge to surface water via groundwater. The proposed project is phased:

Phase 1:

- Reduce the infiltration and inflow (I&I) in the collection system, and
- Construct Infiltration Ponds.

Phase 2:

- Construct four aerated ponds;
- Construct ultraviolet (UV) system; and
- Construct the Blower Building.

Phase 3:

- Remove sludge from existing lagoon cell;
- Construct and line storage cell;
- Construct headworks, and
- Construct lift station.

This application is for construction and construction engineering of Phase 2 only.

The project is essential to protection of the Yellowstone River.

Applicant Name Simms County Sewer District
Project Title Wastewater System Improvements

Project Abstract

The existing facultative lagoon consists of two primary cells and one secondary cell with a spray irrigation system for the treated effluent. The secondary treatment cell has rarely received wastewater from the two primary cells and the irrigation system has never been used. The original 6-inch bentonite liners in the primary cells have deteriorated over time and are leaking partially treated wastewater into the aquifer. The Montana Department of Environmental Quality (DEQ) sanitary survey has determined that the lagoons are leaking about 10 times the State's allowable rate. Water balance calculations provided in the Preliminary Engineering Report (PER) indicate the lagoons are leaking approximately eight times the allowable rate.

A recent TV inspection of select collection mains indicates that several pipe gaskets are separated and potentially leaking raw sewage into the groundwater system.

The Simms Wastewater Improvements Project consists of two phases. Phase 1 is proposed for funding in this cycle and Phase 2 during a later funding cycle.

Phase 1:

- TV inspection of the entire collection system to determine other areas of potential leakage; and
- Replace leaking collection mains.

Phase 2:

- Removing nearly 40 years of accumulated sludge from the lagoons and land-applying the material on nearby agricultural land, providing nutrients for crops;
- Modifying the lagoon piping and interpond control structures;
- Lining the lagoons to reduce leakage to meet state allowable rates; and
- Constructing a new spray irrigation system on adjacent agricultural lands for the treated effluent.

The proposed project will reduce the amount of raw or partially treated wastewater leaking into the shallow aquifer. The residents in Simms utilize shallow groundwater wells for their domestic water supply. The potential for contamination of the drinking water supply is significant. The project is needed to protect and preserve the valuable water resource in this community.

Applicant Name South Wind Water and Sewer District
Project Title Water Distribution and Wastewater Collection Study

Project Abstract

Trailer Terrace was constructed on the south side of Great Falls to house temporary Minuteman Missile construction employees without long-range plans. This mobile home court became what is now South Wind Water and Sewer District. Design plans are either inaccurate or nonexistent with no as-built drawings. There are no sewer manholes on portions of the system and no scheduled maintenance has been completed. A Phase 1 project will replace the inadequate lagoon system. The collection system is now used as combined septic tank and drainfield.

The Phase 1 project remedies arsenic which violates federal drinking water standards. With no as-built drawings for the distribution system, it is believed that it is severely undersized and consists of 2-inch black polyethylene main and 5/8-inch services, some galvanized and rotten.

Remaining deficiencies remedied under this Phase 2 application include:

- Provision of manholes for access to collection system for maintenance, cleaning, and televising;
- Completion of cleaning and televising;
- Infiltration and inflow (I&I) study of leaking collection system piping;
- Analyses of hydrogen sulfide on concrete sewer pipe;
- Verifying size, type, and location of wastewater main and services, water main, and water services via potholing and use of a locator service;
- Location and leak detection in the water main and services;
- Provision of as-built drawings for water distribution and wastewater collection systems;
- Development of a capital replacement program for necessary water and wastewater improvements; and
- Resolution of pressing water distribution and wastewater collection system problems encountered in the study such as replacement of galvanized 5/8-inch water services and placing meters on those services.

Applicant Name	Sweet Grass County Conservation District
Project Title	Electric Light Ditch Irrigation Diversion Rehabilitation

Project Abstract

The Sweet Grass County Conservation District (SGCD) requests funding to rehabilitate and improve an in-stream irrigation diversion, on the west bank of the Boulder River approximately two miles south of Big Timber. The diversion supplies water to the Electric Light Ditch headgate owned and operated by the Electric Light Ditch users. Electric Light Ditch has a right to divert a maximum of 25 cubic feet per second (cfs) or 1,000 miner's inches of water from the Boulder River. Diverted water is conveyed through the approximately 5-mile Electric Light Ditch to properties on the south side of the Yellowstone River west of Big Timber. Ditch users utilize the water to irrigate approximately 530 acres of agricultural, domestic, and public land and for other purposes. A small rock structure that requires maintenance is used for diverting water from the river. The annual maintenance uses motorized equipment to place locally derived material into the Boulder River channel to reconstruct the diversion following spring runoff.

A viable, long-term, low-maintenance solution is needed to reduce/eliminate the frequency and difficulties of maintaining an effective diversion to the Electric Light Ditch headgate. The SGCD proposes to obtain a grant to fund rehabilitation and improvement of the Electric Light Ditch diversion to meet the following goals:

- Improve water delivery efficiency to the Electric Light Ditch headgate during low flow conditions;
- Minimize impacts to the Boulder River;
- Enhance fisheries habitat at the point of diversion; and
- Maximize benefits relative to cost.

Applicant Name Ten Mile Creek Estates/Pleasant Valley Sewer District
Project Title Wastewater System Improvements

Project Abstract

The district, about two miles north of Helena, operates a wastewater collection and treatment system that serves 806 users through 310 services. A private developer constructed the system in 1978 and it includes a gravity collection system, gravity services, and a lagoon treatment facility. The treatment system consists of a three-cell facultative lagoon system designed for total retention. The cells have an underdrain system that lowers the groundwater table to a minimum of five feet below the bottom of the cells. These underdrains were probably originally intended to divert seasonally high groundwater away from the base of the lagoons to prevent liner failure from "floating" in Cells 1A and 1B. The underdrain system discharges to a U.S. Bureau of Reclamation (USBR) drainage ditch east of the lagoons. The ditch subsequently discharges to Prickly Pear Creek.

Flow monitoring during low groundwater, indicates that wastewater production rates are about 68,000 gallons per day (gpd). The 2008 Wastewater Preliminary Engineering Report (PER) estimates leakage from the lagoons at 26 million gallons per year, or about 70,000 gpd. Based on these estimates, the average detention time is less than 24 hours. The wastewater is receiving only minimal treatment before seeping into the groundwater and underdrain system below the lagoons.

The length of the USBR ditch between the underdrain outfall and the ditch confluence with Prickly Pear Creek is approximately 6,800 feet. After the confluence with the creek, nine residences are along or close to the creek. In addition, Prickly Pear Creek, now contaminated with untreated sewage, flows through the grounds of the Montana Law Enforcement Academy.

To comply with the Order on Consent (AOC), the district will build a total retention treatment system with effluent disposal by evaporation. The system will be sited at the treatment site and the lagoons, liners, and all appurtenances will be designed per the Montana Department of Environmental Quality (DEQ) standards.

Applicant Name Terry, Town of
Project Title Wastewater Treatment Upgrades

Project Abstract

Terry has reached an inflection point. After decades of population decline, the town's population has stabilized, and residents are beginning to see impacts and seeing growth resulting from oil and gas exploration and production activities in the region.

Unfortunately, the town is also facing issues related to its wastewater treatment facility. Increasing regulatory constraints, combined with aging infrastructure, forced the community to evaluate deficiencies in its wastewater system. To obtain and meet new discharge permit requirements, as well as accommodate community growth, the town must now cope with costly system modifications.

The wastewater treatment system was built in 1965. With the exception of cleaning and embankment repair, it has had no significant upgrades. During this time, the population declined to just over 600, significantly lower than the original system capacity of 1,550. Meanwhile, the state and nation strengthened performance requirements and design standards in a coordinated effort to improve the nation's water quality.

As a result, the wastewater treatment system does not meet Montana Department of Environmental (DEQ) design standards and recently issued discharge permit limits. These additional requirements, in conjunction with the community's growth potential, emphasize need for an upgrade to the wastewater treatment system. Without this upgrade, local residents will face a series of permit violations, possible enforcement actions, and, in the event of a connection moratorium, lost economic opportunities.

The proposed project provides a substantial public benefit and allows the town to protect the groundwater and surface water of the lower Yellowstone River ecosystem. Improvements will greatly increase the system's capacity and offer a long-term solution to protecting the environment.

Applicant Name Thompson Falls, City of
Project Title Water System Improvements

Project Abstract

Thompson Falls' 2010 Water System Master Plan Update Amendment, noted a significant problem with providing water to the upper pressure zone. This problem first arose due to user complaints of reduced pressure. The problem was verified through observation, engineering analysis, flow testing, and review of city operation and maintenance (O&M) records for this area. Flow restrictions and high pressure losses occur within the transmission main connecting the Jefferson Street and Ashley Creek storage tanks.

Supply to the west side of the upper pressure zone is not available when the Jefferson Street tank is filling. At these times, the west half of the upper pressure zone has very limited fire protection and very low operating pressures (with the potential for negative pressures). This portion of the upper pressure zone contains dense residential development, together with the city's elementary and middle schools. Reduced pressure and fire flows are risks to public health and safety.

The transmission main that carries water between the Ashley Creek and Jefferson Street storage tanks is composed of 6-inch and 8-inch asbestos cement (AC) pipe that has become brittle and has a history of breaks. Modeling conducted as part of the 2010 Water System Master Plan Update Amendment recommends upgrading this pipe to a 10-inch polyvinyl chloride (PVC) main to support the necessary fire and domestic flows into the upper pressure zone.

The proposed project will eliminate public health and safety risks associated with low pressure and reduced fire flow to the upper service area.

Applicant Name Toston Irrigation District
Project Title Main Canal Rehabilitation, Phase 2

Project Abstract

The Toston Irrigation District (TID) received funding from the Montana Department of Natural Resources and Conservation (DNRC) Renewable Resource Grant and Loan (RRGL) Program for design and construction of a rehabilitation project of the initial half-mile section of the Toston Canal in 2012. The project will be constructed in fall 2014 or spring 2015. In this application, the TID is applying for RRGL funds for the second half-mile stretch of the Toston Canal. The proposed project will preserve the sole source of irrigation water for 6,200 downstream irrigated acres, ensure a reliable and sustainable supply of water for downstream acres, preserve flow augmentation within Warm Springs Creek, decrease the operation and maintenance efforts for irrigation practices, and conserve water.

The TID identified a 1.5-mile reach of the Toston Canal as a reach of concern due to significant water losses from seepage. These seepage losses are primarily caused by sandy or cobbly soils that have high permeability and create a path for water to seep from within the canal. Seepage loss within the Toston Canal forces downstream users to implement water rationing, reducing the irrigation capacity of the canal. Seepage losses decrease water available to augment flows within Warm Springs Creek, thereby diminishing fish and wildlife habitat.

By implementing seepage mitigation procedures, approximately 4.79 cfs (486.2 million gallons of water per year) will be conserved within the half-mile stretch of Toston Canal proposed for rehabilitation. These efforts will increase irrigation capacity resulting in reliable delivery of irrigation water for downstream acres and decreased operation and maintenance costs. Seepage mitigation will provide a larger volume of water to augment flows within Warm Springs Creek, enhancing fish and wildlife habitat due to increased irrigation efficiency within the canal.

Applicant Name Tri-County Water District
Project Title Water System Improvements

Project Abstract

Tri-County Water District has numerous deficiencies with their water storage, source and distribution systems.

Water Storage. Despite many repairs, the 191,000-gallon storage tank is leaking despite many repairs and must be replaced with a new tank that will provide adequate capacity to meet maximum day storage requirements.

Water Source. The 2013 Sanitary Survey identified the needed system improvements at the district's well houses, including:

- Install a gate valve on the common header at the well house and a sampling hydrant downstream from the header;
- Install a sample hydrant before the first use to allow for chlorine residual sampling;
- Screen the ends of the two vent openings for well #1 to ensure insects and other contaminants could not enter the well;
- Install a back-up chlorine cylinder vacuum regulator;
- Install a digital meter directly downstream from well #1 to communicate with the monitoring equipment in well #2; and
- Replace both aging pumps at well house #1.

Distribution System. User complaints and the hydraulic model of the system indicate numerous pressure deficiencies within the distribution system including:

- Available flow and low pressure deficiencies require replacing about 13 miles of distribution mains which serve areas with predicted and reported inadequate pressure to deliver the contracted flow rates during high demand periods;
- During maximum day demand, approximately one-quarter of the system drops below 35 pounds per square inch;
- During peak hourly demands, approximately one-fifth of the system drops into negative pressures and about one-half drops below 35 psi;
- In addition to low system pressures in some areas of the system, during average day demand pressures are above 80 psi for about half the system; and
- The system does not meet Montana Department of Environmental Quality (DEQ)-1 criteria to provide 20 psi minimum pressure under all flow conditions.

Applicant Name Upper and Lower River Road Water and Sewer District
Project Title Water and Sewer Improvements, Phase 5

Project Abstract

The Upper and Lower River Road Water and Sewer District includes unincorporated subdivisions and unplatted lands south of Great Falls.

The Montana Department of Environmental Quality (DEQ) and the City-County Health Department (CCHD) produced a groundwater study of the area in 1997 and 1998, and found high levels of nitrate and ammonia in drinking water wells.

A long history of water quality problems exists in these small public and private systems. On-site wastewater systems are degrading area wells and groundwater quality. Local drainfields have failed in recent years. Groundwater degradation has resulted in a moratorium on new on-site wastewater disposal systems.

The district has successfully completed four phases of water and sewer main installation and annexation to Great Falls.

Groundwater degradation, septic failures, diminishing well production, and well water quality remain critical concerns in the unserved district areas. Extremely small lot sizes exist in the remaining portions of the district. In almost every case, lot size is insufficient for a 100-foot separation from well to septic tank, and very few lots have adequate size for a replacement drainfield area. Therefore, the district is proposing a Phase 5 water and sewer project to correct these deficiencies.

The recommended Phase 5 area will serve Grandview Tracts (remaining unserved properties along 4th Street South and 21st Avenue South) and unserved properties immediately north and adjacent to Upper River Road. The area includes 17 Equivalent Dwelling Units (EDU).

Final unit quantities include approximately 1,705 lineal feet of 8-inch water main, 6 fire hydrants, 2,185 lineal feet of 8-inch sewer main, 9 manholes, and 17 water and sewer services. Water meters are proposed and will be installed.

Applicant Name Westby, Town of
Project Title Wastewater System Improvements

Project Abstract

Westby's wastewater collection and treatment system, installed in 1972, is leaking raw and untreated wastewater through a failing clay liner. A leak study showed that over 5.5 million gallons per year of untreated wastewater is directly mixing with groundwater in the area. This equates to 95.2 inches/year, well over the Montana Department and Environmental Quality (DEQ allowable amount of 6-inches/year. The treatment system does not meet current design standards.

Westby is surrounded by well-drained soils which do not retain water. Therefore, the raw wastewater leaking from the lagoons drains through soils and makes its way into the groundwater aquifers below, which are the town's water source. Since Westby lies in the prairie pothole region, direct hydraulic connectivity exists between groundwater and surface water, leading to untreated water surfacing in nearby pothole lakes. This presents a public health hazard which would be eliminated by the proposed project.

The Wastewater System Preliminary Engineering Report (PER documented deficiencies in the town's wastewater system:

- Significant leakage of raw and partially treated wastewater from the failing lagoons;
- Lagoons failing to meet current DEQ standards for treatment and sizing; and
- Failing lagoon piping and control structures.

Improvements recommended to fix the deficiencies:

- Refurbishing the existing cells including sub-base, rip rap, and a new polyvinyl chloride (PVC) liner; and
- Installing a center pivot irrigation system to dispose of treated effluent as a beneficial reuse of wastewater.

Proposed improvements to the lagoon and installation of irrigation system will conserve, manage, and preserve natural resources by preserving groundwater from the influence of 5.5 million gallons of untreated wastewater and conserve water from other sources by using treated effluent for irrigation of crops.

Applicant Name White Sulphur Springs, City of
Project Title Wastewater System Improvements, Phase 2

Project Abstract

The wastewater treatment facility in White Sulphur Springs, originally constructed in 1959, and consists of a two-cell, facultative lagoon. The facility discharges to a tributary of the Smith River. Continual BOD₅ and total suspended solids (TSS) violations of its Montana Pollutant Discharge Elimination System (MPDES) permit subjected the city to an Administrative Order on Consent (AOC) issued by Montana Department of Environmental Quality (DEQ) in 2011. A new MPDES permit, expected to be issued in 2014, will impose additional limitations with which the existing facility cannot comply. In 2012, the city initiated a two-phase project to address its wastewater compliance issues. Phase 1 (to be completed in June 2014) will rehabilitate 8,800 lineal feet of sewer and drastically reduce the amount of groundwater infiltration into the collection system. Control of groundwater infiltration was necessary to allow design of a Phase 2 treatment facility with a more reasonable hydraulic capacity. Phase 2 will involve necessary upgrades to the treatment/disposal system to achieve the city's compliance objectives. The proposed solution is to implement a two-cell, aerated treatment facility with seasonal storage and spray irrigation disposal. Converting the city's wastewater disposal strategy to a nondischarging system will permanently eliminate any pollutant discharges to surface waters, enhance surface water quality, and allow the city to terminate its MPDES permit. The beneficial reuse of treated wastewater and accumulated sewage sludge represents environmentally responsible methods to dispose of the city's domestic waste and will result in increased agricultural production and water reuse. Resource benefits will include: improved water use efficiency; improvement of surface water quality; advancement of farming practices and; protection of natural resource-based recreation through enhancement of Smith River water quality.

Applicant Name	Whitefish, City of
Project Title	Wastewater Infiltration and Inflow Mitigation

Project Abstract

Whitefish has over 58 miles of sewage main and 17 lift stations required to serve homes and businesses found on the varied topography throughout the community. Much of the collection system is made of older piping materials or was installed with poor construction practices. The existing collection system allows clear water to enter the pipe network through leakage in the pipe joints, leakage in manholes, roof drains, sump pumps; and inflow through manhole covers. During wet weather and snowmelt, and over half of the flow to the plant may be clear water. Annually, over 16% of the flow to the plant is clear water. The city anticipates new regulatory standards from the Montana Department of Environmental Quality (DEQ) within the next five years, limiting the discharge of ammonia, total nitrogen, and phosphorous from the wastewater plant. These standards cannot be met with the city wastewater treatment system and a costly new treatment facility will be required under a mandated compliance schedule. Reduction in the average and peak flow volumes to the plant by removal of clear water now could significantly reduce future cost of a new plant. With implementation of the recommended Infiltration Mitigation project, up to 100,000 gallons per day of infiltration/inflow could be removed from the system. This flow volume represents almost 10% of the current annual average daily flow to the plant. A corresponding reduction in chemical use and energy savings in the plant and collection system could be anticipated. Improved performance in the treatment plant will translate into better water quality in the Whitefish River and result in improved opportunities for natural resource-based recreation and better overall protection of the general public health.

Applicant Name Winifred, Town of
Project Title Water System Improvements

Project Abstract

The water system for Winifred, serves approximately 208 people in central Montana. The water system consists of approximately two miles of 4-and 6-inch distribution lines throughout town, two public supply wells, and a 50,000-gallon metal storage tank.

The major problems with the town's water system include: inadequate storage tank capacity and fire reserves, limited static and residual pressures, minimal hydrant flow rates, undersized water mains, unmetered water users, and system pumps and various other deficiencies related to the town's pumphouse. Lack of adequate storage, and system pressure leads to periods of negative pressures within the mains when water demand exceeds supply. These times of negative pressure can introduce widespread contamination and significant health risk to system users. Inadequate water supply also forces the town to operate under water use restrictions in summer, drastically limiting fire reserves.

Several of alternatives were evaluated to determine a feasible solution to the system's deficiencies. The preferred alternative for water system improvements is to construct a 170,000-gallon concrete storage tank west of town to increase water supply and system pressures. Water meters installed at each service connection and at the supply wells will monitor and minimize water usage and allow the town to transition to a usage-based billing system.

This project will conserve the water supply as Winifred begins billing based on usage rather than flat rate, a practice that traditionally leads to lower water usage. Meter installation generally corresponds to a reduction in water usage of approximately 30% to 40%. The project may also be seen as preserve water by limiting potential system contamination by increasing system pressure and eliminating negative pressure.

Applicant Name Yellowstone Boys and Girls Ranch Water and Sewer District
Project Title Wastewater Improvements

Project Abstract

The Yellowstone Boys and Girls Ranch (YBGR) is a private nonprofit corporation serving high-risk youth. The 410-acre campus, west of Billings, operates as a public Water and Sewer District (WSD). The wastewater treatment system fails to properly treat the wastewater generated from the facilities before to its release into Canyon Creek.

Since May 2007, the Montana Department of Environmental Quality (DEQ) has issued multiple violation letters to YBGR outlining effluent nutrient levels surpassing limits set within the YBGR Discharge Permit. After more than three years of continued permit violations, DEQ issued an Administrative Order on Consent (AOC) to address the violations. Since then, the YBGR has tried to determine a financially feasible solution to facilitate a reduction in effluent nutrient levels to preserve the natural ecosystem of Canyon Creek.

The YBGR's wastewater treatment system consists of a three-cell facultative lagoon discharged biannually to Canyon Creek. Ineffectiveness of the system can be attributed to (1) The inability of the facultative lagoons to properly treat wastewater in accordance with today's increasingly stringent effluent limitations, and (2) an insufficient detention time for a large portion of wastewater within the system due to the current discharging schedule.

The YBGR proposes to improve its wastewater treatment system by restoring existing lagoons to their original depth, replacing the lagoon cell liners, installing an aeration system within the lagoons, and installing a limestone rock filter to facilitate nutrient removal. Once the improvements are complete, a new discharge schedule will be developed and a new discharge permit issued for continued operation of the system.

This project will enable the YBGR to improve the quality of the water released to Canyon Creek, improve water quality for downstream users, improve aquatic habitat, and preserve the natural ecosystem.